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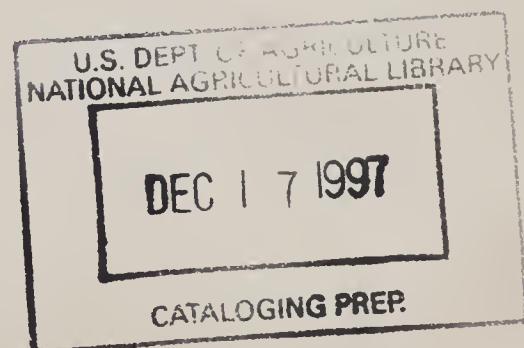
Various Methods of Supporting the Price of Cotton

(A study requested by the Senate Committee
on Agricultural Appropriations)

U. S. Department of Agriculture
Washington, D. C.

December 31, 1956

Agriculture-Washington





The alternative programs from prices. It also makes rough estimates of the relative effects of each type of program upon cotton acreage and production, domestic consumption, exports, cost to the Government, and income to cotton growers.

The report is not intended as an argument for or against any of the alternative programs that were analyzed. Rather, it is a factual statistical analysis to provide the Congress certain basic estimates that it requested. The Department hopes, of course, that these estimates will be helpful as part of the material to be considered in developing a program that will further the long term interests of cotton growers and the general public.

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Section I
SUMMARY

On May 18, 1956, the report of the Committee on Appropriations of the Senate for the Agricultural and Farm Credit Appropriation Bill, 1957, included a resolution requesting "a full detailed report and analysis of the various systems for supporting the price of cotton." This resolution, quoted in full on page 13, specified certain points that the Committee wanted included in the report. This report is in response to this resolution.

Main Problems Confronting Cotton

The record high cotton stocks of the United States are perhaps the most dramatic evidence of the problems facing United States cotton producers. These stocks, about 14.5 million bales on August 1, 1956, 1/ have accumulated because production has outstripped disappearance. During the 1953-55 seasons United States production averaged more than 13 percent above that of the 1920's, even though the acreage of cotton in cultivation was only half as large. The consumption of cotton per capita in the United States was about the same as it was in the 1920's, even though the consumption of all fibers 2/ increased about 25 percent. Exports during the 1953-55 period were only about 44 percent of those during the 1920's, even though foreign consumption of cotton increased more than 60 percent.

The world demand for textiles is steadily growing. But the increased demand is being met mainly by foreign cotton and by manmade fibers, rather than by United States cotton. A relatively high price for United States cotton has tended to encourage the increase in the acreage of foreign cotton and the expansion of manmade fiber consumption at home and abroad.

United States cotton yields have been increasing rapidly in recent years and appear likely to continue to increase in the future. Expanded domestic markets and a greater share of export markets are urgently needed or United States cotton producers will be faced with even further reductions in acreage. The estimate of the 1956 harvested acreage is the lowest since 1882.

One way to expand markets for cotton is to sell American cotton for prices which would discourage further expansion in the production of foreign cotton and of manmade fibers at home and abroad. This is not to say that lower prices, within reasonable limits, would cause the production of competing fibers to decline very much if at all from recent levels. Lower cotton prices, however, would doubtless tend to slow up the rate of expansion in the output of competing fibers. The total consumption of fibers both in this country and abroad is expected to continue to increase. If the rate of expansion in the output of competing fibers is slower than the rate of expansion in the consumption for all fibers, the demand for U. S. cotton will increase.

1/ The carryover on August 1, 1957 is estimated at about 12.3 million bales.
2/ Cotton, wool, manmade fibers, flax, and silk.

The support price system for cotton could be modified in several ways so as to make cotton more competitive either in export markets or in both domestic and export markets and thus stimulate larger markets for United States cotton.

Various Two-Price Systems of Price
Support and Marketing Which Could
be Made Applicable to Cotton

This section of the report describes several possible ways of selling cotton in export markets at prices lower than those charged to domestic users. Some of the programs described in this section of the report are not two-price plans according to many definitions. Systems covered under two-price plans include Cash Export Subsidy, Sale of CCC Stocks for Export, Certificate and Processing Tax Plans, and International Cotton Agreement and hereinafter are so identified.

Sale of CCC Stocks for Export.- American cotton is now exported at prices considerably less than those paid by domestic users. Recent sales of American cotton by CCC for export have been made at prices averaging slightly above 25 cents per pound, basis middling 15/16 inch. The comparable CCC loan rate is 31.59 cents. The purpose of this program is, of course, to expand exports and thus to move cotton surpluses into consumption. In this case the cotton farmer receives the same price for cotton whether it is used in the domestic or the foreign market. The Government absorbs the loss on the cotton sold for export.

During the past several years cotton has been sold abroad mostly at the 90 percent support level. During the past two years, some cotton was exported for foreign currency and under barter arrangements. In spite of these programs, the volume of exports declined in 1955-56 to the second lowest level in any peacetime year since 1871, about 2.2 million bales.

Recent legislation required that upland cotton from Commodity Credit Corporation stocks be made available for export at prices in line with prices of foreign cotton. Since this program started, cotton exports have increased substantially and for the 1956-57 marketing year are expected to increase to about 6.5 million bales. However, much of this increase can be attributed to small cotton stocks abroad which were about 2 million bales smaller on August 1, 1956 than a year earlier. The decline in stocks occurred because importers abroad limited their imports from the U. S. in anticipation of the drop in U. S. export prices. The crisis in the Middle East has also been a factor contributing to the increased export of United States cotton.

Cash Export Subsidy.- A somewhat different approach would be to make cash payments to cotton exporters on all cotton exported. The amount of such a subsidy could be the same as the difference between support rates and Commodity Credit Corporation export sales prices. The effect on exports probably would be about the same as under the CCC export sales program.

Under the Sale of CCC Stocks for Export system practically all cotton exports would move through CCC, thus limiting the activities of cotton merchants. Under a Cash Export Subsidy system exports would be handled directly by cotton buyers and merchants.

International Cotton Agreement.- There are several other possible means for making United States cotton more competitive. If an international agreement could be negotiated comparable to that for wheat, under which all of the principal producing and consuming countries would agree on maximum and minimum prices and quotas, the United States might obtain a larger share of the world cotton market. This, however, has been explored and it appears that there is little possibility of such an agreement being developed. A principal and vexing problem centers around the development of quotas that are mutually satisfactory to all countries. Other difficult problems are created because many kinds of cotton have distinctive characteristics, each kind having many different qualities and uses.

Certificate Plan.- Another means for improving the competitive position of United States cotton in the export market would be to adopt some form of a certificate plan whereby all United States cotton would sell at world prices. The market price would be supported by a Commodity Credit Corporation loan. Domestic processors would be required to purchase certificates covering their requirements, with payments to producers approximately equal to the certificate proceeds. Each cotton grower would be given a cotton acreage allotment representing his share of both the export and domestic markets. He would also be given a domestic marketing quota in pounds or bales representing his share of the domestic market. If he did not exceed his cotton acreage allotment, he would be eligible to receive marketing certificates covering his domestic marketing quota. These certificates could have a redemption value equal to the difference between the domestic price objective and the loan rate or the domestic price objective and the market price, whichever was smaller. For example, the domestic price objective might be set at 90 percent of parity and the market price or loan rate might be at 65 percent of parity. In this case the value of the certificate would be $90 - 65 = 25$ percent of parity. The cotton grower would sell his certificates either along with his cotton or separately. Domestic spinners would be required to buy certificates for each bale of cotton used to produce textiles for the domestic market.

This system would assure the producers a higher return on that cotton produced for domestic consumption. Such a plan would be mainly self financing in the sense that the cost would be borne by domestic consumers of cotton, rather than by the Government. Since the grower would get a much lower price on his production above the domestic quota, he would have less incentive to expand production under a certificate program than under a program that supports the entire crop at the domestic price objective level. Such a plan would not help to recapture domestic markets that have been taken over by substitute materials nor would it help to prevent further loss of the domestic market. However, a lower domestic price objective under this or other systems, of say 80 percent of parity, might help to hold some domestic markets that are currently threatened by substitute materials. The Certificate Plan would enable U. S. cotton to compete more effectively with foreign produced cotton and manmade fibers in world markets.

The effects of a Certificate Plan could be obtained by a Processing Tax Plan. The mechanics of administering a Processing Tax Plan would be much simpler than the mechanics of administering a Certificate Plan.

With any of the systems discussed above it appears that some production controls would be necessary in 1960. Under any of these systems less stringent controls would be needed than those required under high support prices on the whole crop.

Fixed 90 Percent of Parity
Supports and a Flexible
Support Price System

It would be possible to support cotton prices at 90 percent of parity or even 100 percent of parity if we are prepared to accept the consequences. Experience has shown, however, that the commercial market for American cotton at 90 percent of parity is limited. A continuous program of supporting prices at these levels would require much more drastic controls over acreage, production, and marketings than we have ever had in the past.

These difficulties would be only partly overcome by a flexible price support between 75 and 90 percent of parity. When cotton supplies were above normal, support levels would be reduced. Such a system could encourage higher rates of domestic consumption and exports and discourage overproduction, especially if the support level were held near 75 percent of parity over a period of years. Unless the support system were far more

flexible than that authorized by present legislation, even within the 75 to 90 percent range, there would still be a need for rather drastic production controls. Under a more flexible support system within the 75 to 90 percent range, production controls would be less drastic than under a fixed support at 90 percent of parity.

Instead of the present 75 to 90 percent flexible support system, a program might be authorized for cotton similar to those now in operation for the mandatory non-basic commodities. Support might be authorized at such a level between 60 and 90 percent of parity as would bring about a balance of production and market purchases without production controls. One obvious problem would concern the estimation of the price that would bring about such a balance. Perhaps production and disappearance would about balance in 1960 without production controls if cotton prices averaged about 60 percent of parity over the next few years. In the more distant future, balance might be achieved at about 70 percent of parity, primarily because lower prices over a period of years would stimulate the growth of markets.

A Price Support System Based Upon Prices
of Items Used in Cotton Production and
A Price Support System Adjusted for
Changes in Cotton Production Efficiency

An index representing the composite average price of items used in producing cotton was developed for each year, 1945 through 1955 and for 1939. Average quantities of individual production items used during the 1947-49 period were used as weights and appropriate prices were applied to the respective items. No distinction was made between cash and non-cash items. The price index (1945=100) was multiplied by the parity price for cotton in 1945 (when cotton prices were about equal to the parity price then current). The product, which is herein called "Cotton's Own Parity," was slightly lower than "Old Parity" for cotton in all years except 1952. In 1955 Old Parity was about 35.2 cents per pound and Cotton's Own Parity was 34.6 cents per pound. A system called "90 Percent of Cotton's Own Parity" is analyzed in this report.

Changes in the efficiency of producing cotton were appraised for each year from 1945 through 1955. Quantities of labor, land, power, machinery, fertilizer and other materials and services, except management and general overhead items, used in producing the United States cotton crop for each year were estimated. Weighted aggregates of these input quantities were developed for each year by applying appropriate 1947-49 average prices to the quantity of each individual input or production item and combining the products. From these data an index was constructed using 1945 as the base year.

By dividing the quantity index of inputs used by an index of cotton production, both based on 1945, an index of input quantities per bale of cotton (herein called the "Efficiency Modifier") was developed. This index indicates that total quantity of inputs per bale of cotton was reduced sharply from 1945 to 1955. The quantity of inputs per bale was about 30 percent less in 1955 than in 1945. Some downward trend may continue for several more years. The application of the Efficiency Modifier (1945=100) to the Old Parity price or to Cotton's Own Parity would have resulted in a substantially lower parity price in most of the years considered. For 1955, for example, the Old Parity price multiplied by the Efficiency Modifier results in a price of 24.2 cents per pound and Cotton's Own Parity multiplied by the Efficiency Modifier gives a price of 23.9 cents per pound.

In the above illustrations the year 1945 was used as a base for both Cotton's Own Parity and the Efficiency Modifier. Any other year for which data are available, however, could be selected as the base for calculating parity prices. If the year 1939 had been selected as a base, Cotton's Own Parity in 1955 would have been 47.2 cents per pound and if adjusted to reflect the Efficiency Modifier it would have been 30.2 cents per pound. If the price were based on Old Parity and adjusted for increased efficiency since 1939, a parity price of 22.5 cents would have resulted in 1955. This illustrates the pronounced effect that the choice of a different base period for these indexes can have on such calculations.

The foregoing discussion assumes that cotton prices would be adjusted in such a way that all the gains from increased efficiency in cotton production would be reflected in lower prices. This raises important questions of policy, especially the question of whether farmers should not retain at least part of the benefits from improved methods. Perhaps some means could be established wherein part of the gains would be retained by cotton farmers and part reflected in lower prices in order to improve cotton's competitive position for markets. In analyzing the effects of a support system based on Cotton's Own Parity and the Efficiency Modifier, one half of the results of increased efficiency is assumed to be reflected in price. This system is called "Cotton's Own Parity with 50-Percent Efficiency Modifier" and uses 1945 as a base.

The data at hand permit a limited appraisal for the period 1945-55 plus some indications for the prewar year, 1939. But it is questionable if available data are adequate to use as a basis for developing a price support program. Moreover, to obtain and to keep current the kind of data needed would be difficult.

Modernized and Old Parity and the Base Quality for Price Support Purposes

Old Parity maintains a fixed relationship between the prices for cotton and other farm products. Modernized Parity reflects the changing relationship between the prices received by farmers for cotton and for

other farm products. The changing relationship between these prices is intended to allow for relative changes in the demand for various farm products and the cost of producing them. The difference between the Modernized and the Old Parity price for cotton is slight - 35.81 and 36.21 cents per pound, respectively, in mid-November 1956.

Under present legislation, middling 7/8 inch staple is the base quality for price support purposes. If the base quality were shifted from middling 7/8 inch to the average quality of the crop, the average level of support would be lowered. The average value of a crop of normal qualities (5-year average), if based on the 1956 support differentials for quality, is about 1.6 cents per pound above the value for middling 7/8 inch cotton.

Economic Effects

Each system of price support in the foregoing discussion was analyzed for its economic effects under assumed general economic conditions. For illustration purposes these effects were estimated for 1960. The pertinent points compared are:

- (1) Size of disappearance.
- (2) Size of the acreage reduction below uncontrolled acreage required by each system to balance production and disappearance.
- (3) Cost of each system to the Government.
- (4) The farm value of the crop (lint only).
- (5) Farm value of crop less cost to Government.
- (6) Net farm income.

The ranking of the various systems with respect to each of these points is shown in the tables in Section VI.

The largest disappearance is estimated for the Cash Export Subsidy, Sale of CCC Stocks for Export, and the Certificate systems in 1960, 14.7 million bales; the smallest for the 90 Percent of Parity system, 11.4 million bales. The Certificate Plan requires the smallest acreage reduction and the 90 Percent of Parity system the largest.

Total costs to the Government (administrative and non-administrative) for the two-price systems range from about 0.3 billion dollars for the Cash Export Subsidy and the Sale of CCC Stocks for Export systems with 65 and 90 percent of parity price objectives to less than 0.05 billion for the Certificate Plan. For all other systems, if fully effective controls over production could be assumed in 1960, cost to the Government would be relatively nominal. This would involve much more drastic controls than have been in effect in the past. If such drastic controls were not feasible, the cost to the Government would be much higher than that estimated in this report.

Disregarding cost to the Government, the highest estimated farm value

for the cotton crop in 1960, 2.3 billion dollars, would be obtained under the Cash Export Subsidy and Sale of CCC Stocks for Export systems with price objectives of 65 and 90 percent of parity. The estimated value under the 90 Percent of Parity system is the smallest, about 1.8 billion dollars.

Once again ignoring cost to the Government, the largest net farm income, about 1.8 billion dollars, is estimated in 1960 for the Cash Export Subsidy and Sale of CCC Stocks for Export systems with 65 and 90 percent of parity price objectives. The Cotton's Own Parity with 50-Percent Efficiency Modifier system shows the lowest estimated net farm income, about 1.4 billion dollars. If Government cost is deducted, differences between the various systems are narrowed.

Beyond 1960 it becomes more and more difficult to evaluate the precise economic effects of the several programs. The programs and policies followed between now and 1960 will doubtless affect the cotton industry for many years beyond that date. A cotton price low enough to make cotton competitive both in the domestic and foreign markets in 1960 would set in motion forces that would, in the long run, increase the consumption of United States cotton. For this reason, in the more distant future, the relative position of the two 90 percent systems would probably tend to worsen. They would tend to discourage domestic and foreign use of American cotton relative to the other systems; hence comparatively less land would be devoted to the production of cotton.

Section II
THE RESOLUTION

On May 18, 1956, the Committee on Appropriations of the Senate reported the Agricultural and Farm Credit Appropriation Bill, 1957 (Report No. 2023). This report contained the following resolution:

"Report on Systems of Price Support for Cotton

"Pursuant to a resolution adopted by the Committee on Appropriations:

"The committee requests the Secretary of Agriculture to submit by September 1, 1956, a full detailed report and analysis of the various systems for supporting the price of cotton. In making his report the Secretary shall indicate the advantages and disadvantages, probable costs (including administrative) of each system of price support studied, together with the effect each system would be likely to have upon the domestic consumption and export of cotton and upon the net incomes of cotton producers. In making this study and reporting thereon the Secretary shall include but not be limited to the following systems of supporting the price of cotton:

"(1) The various two-price systems of price support and marketing which could be made applicable to cotton;

"(2) A price support system based upon a fixed 90 per centum of parity;

"(3) A flexible price support system of between 75 and 90 per centum of parity;

"(4) A price support system based upon the prices paid by cotton producers for labor, materials, equipment, power, and other items used in the production of cotton;

"(5) A price support system based upon a method which permits the adjustment of the level of price support, determined as provided in clause (4), to any change in the relative efficiency of producing cotton; and

"(6) The advantages and disadvantages of determining parity price in accordance with the method provided under the provisions of section 301 (a) (1) (A) of the Agricultural Adjustment Act of 1938 (the so-called modernized parity formula), compared with the method used prior to the enactment of the Agricultural Act of 1948 (the so-called old parity formula)."

Subsequently, the date for the report by the Secretary of Agriculture was changed to January 1, 1957. This report is in response to the Resolution.

SECTION III

Main Problems Confronting Cotton

The record high cotton stocks of the United States are, perhaps, the most dramatic evidence of the problems facing the United States cotton producers. On August 1, 1956, these stocks were about 14.5 million bales. ^{3/} They have increased each year since 1951 when they stood at about 2.3 million bales. (See figure 1.) The August 1, 1956 stocks were more than adequate to meet annual requirements for domestic consumption and exports at average rates of the recent past without a single bale of new-crop cotton.

The sharp increase in the carryover has occurred because production outstripped disappearance. Despite acreage controls in 1954 and 1955, production averaged about 14.1 million bales per year while disappearance averaged about 11.9 million bales. (See figure 2.)

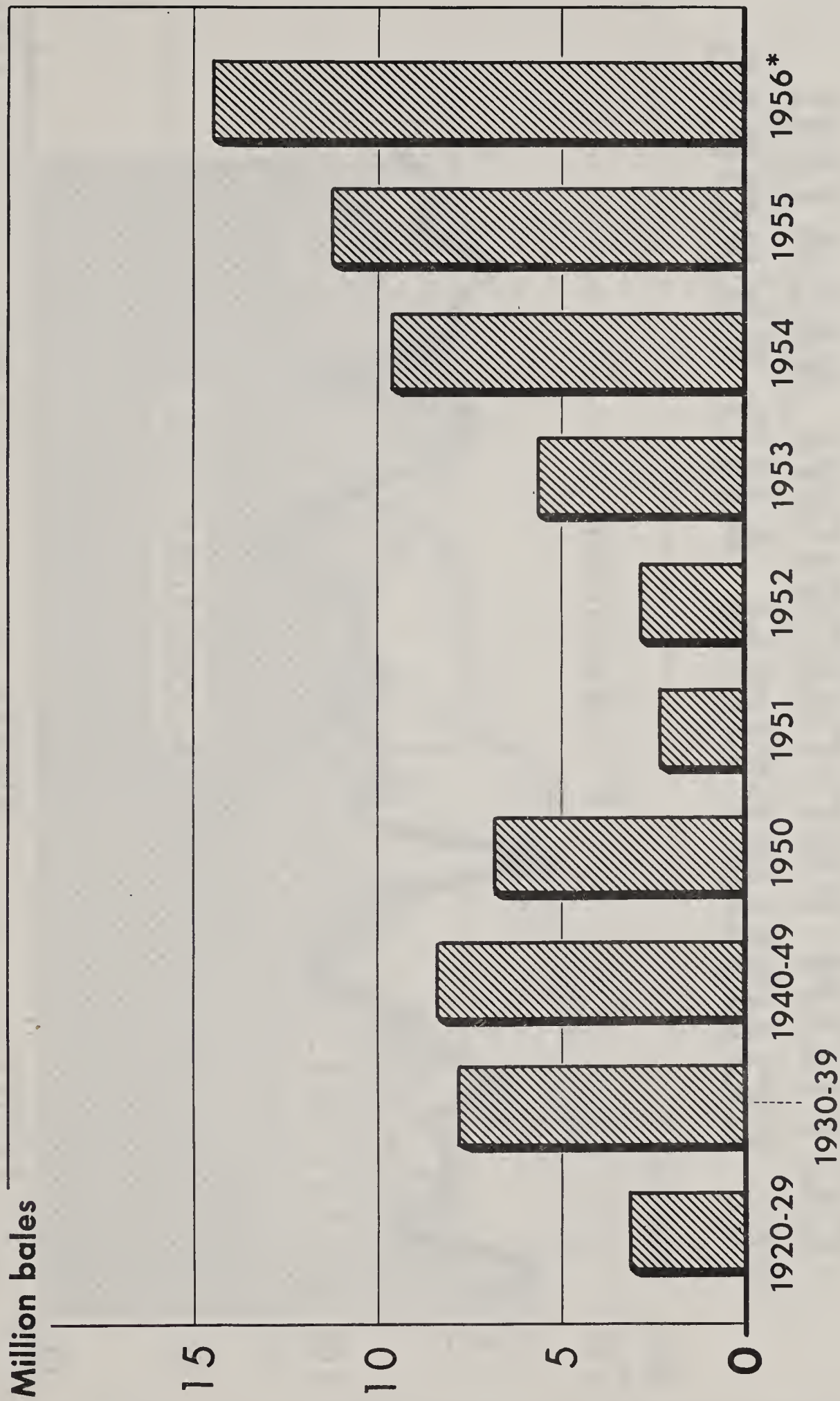
Production during the 1953-55 period has been large because of very high yields, as shown in figures 3 and 4. During this period cotton production averaged approximately 13 percent more than during the 1920's, but cotton acreage harvested was only about half as large. Although yields per acre have been trending upward since the mid-1920's, the increases in the last 4 years have been especially sharp. The average yield per harvested acre in 1956 was about 2.4 times that of 1925. It appears likely that yields will continue their upward movement for some time in the future.

While yields and production were increasing, disappearance was declining. In the 1953-55 period disappearance was about 11 percent smaller than during the 1920's. Exports were about 44 percent of those during the 1920's, but domestic mill consumption increased by approximately 40 percent.

Domestic mill consumption increased in about the same proportion as did population. Although per capita consumption of cotton was about the same in the 1953-55 period as it was in the 1920's, the per capita consumption of all textile fibers (cotton, wool, manmade fibers, flax, and silk) was about one fourth larger in 1953-55 than in the 1920's. This increase was caused by larger consumption of manmade or synthetic fibers, as shown in figure 5. Their consumption increased by almost 9 pounds per person between the 1920's and 1953-55. The inroads made by manmade fibers into natural fiber markets is probably larger than indicated by the poundage figures because some types of manmade fibers substitute for more than a pound of other fibers. In other words, the cotton equivalent of the manmade fibers is greater than indicated by the actual poundage of manmade fibers and on this basis the comparative standing of cotton is even less favorable.

^{3/} The carryover on August 1, 1957 is estimated at about 12.3 million bales.

CARRYOVER OF COTTON: BEGINNING OF SEASON; UNITED STATES, 1920-29 TO DATE



* PRELIMINARY

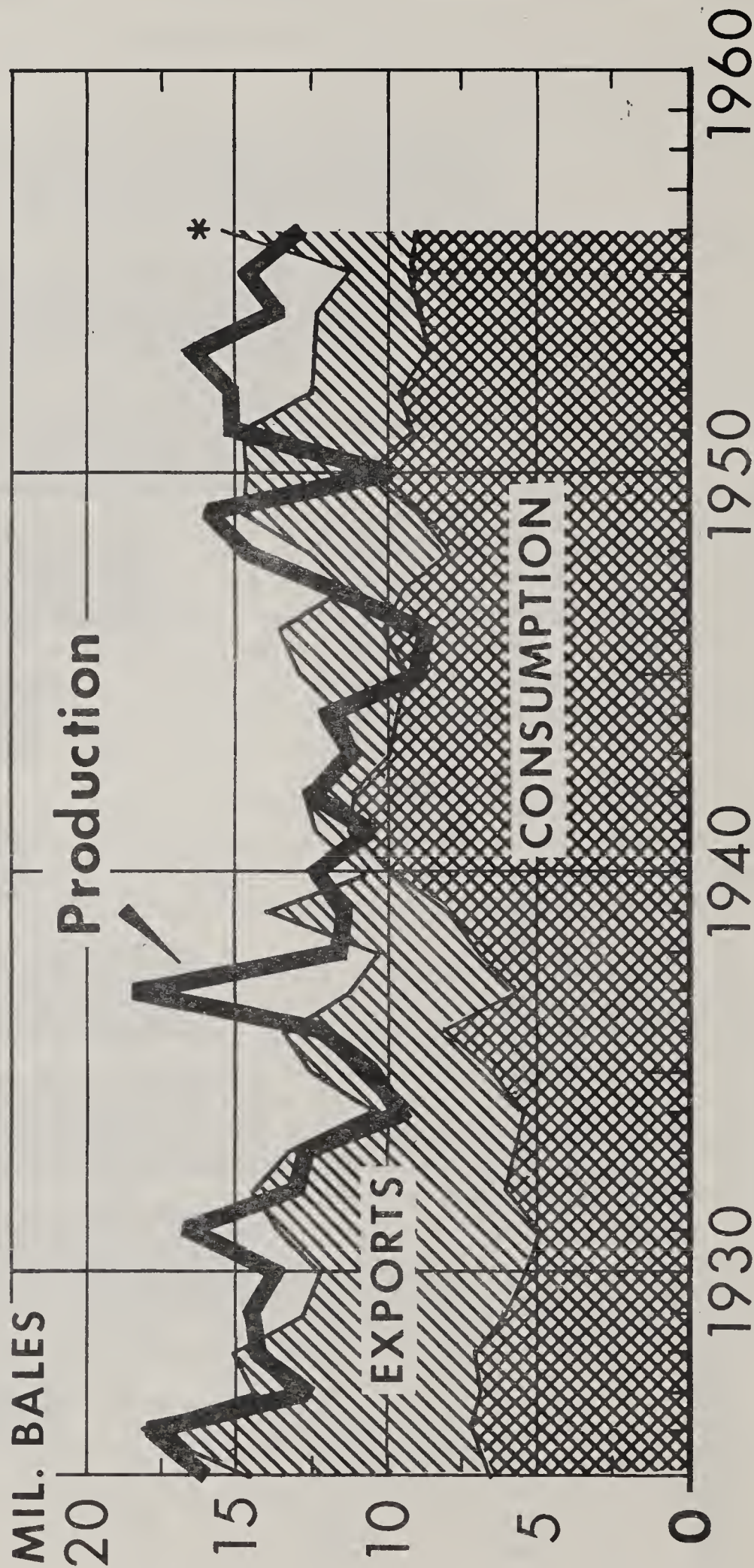
U.S. DEPARTMENT OF AGRICULTURE

NEG. 3646-56 (10) AGRICULTURAL MARKETING SERVICE

Figure 1

For U. S. Crop

COTTON PRODUCTION RELATED TO CONSUMPTION AND EXPORTS



DATA ARE FOR RUNNING BALES

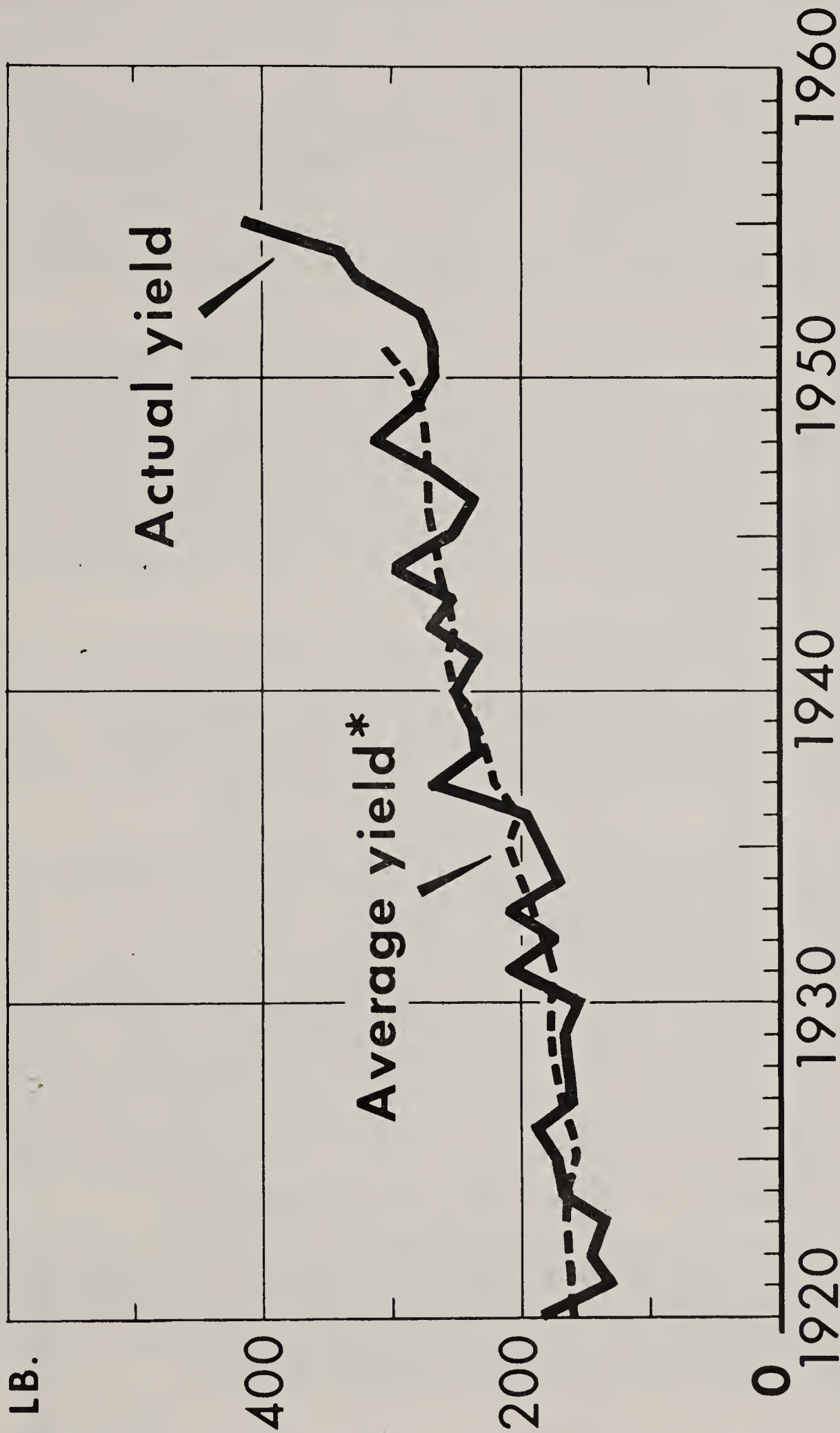
* FORECAST

U. S. DEPARTMENT OF AGRICULTURE

NEG. 1061-56 (12) AGRICULTURAL MARKETING SERVICE

Figure 2

COTTON YIELDS PER ACRE



*9-YEAR MOVING AVERAGE, CENTERED, PER HARVESTED ACRE

U. S. DEPARTMENT OF AGRICULTURE

NEG. 1030A-56 (7) AGRICULTURAL MARKETING SERVICE

Figure 3

Increases in manmade fiber consumption have been associated with declines in cotton consumption in the past. If there had not been an increase in consumer income from the 1920's to the 1950's, consumption of cotton per person in the United States probably would have declined because of the rapid growth in manmade fiber consumption. Since 1944 prices for rayon and acetate generally have been slightly below prices for cotton, and prices for these fibers have moved parallel to each other. Prices for cotton during this period have been high enough to encourage expansion in the output of rayon and acetate. Even though prices for fibers have only a relatively minor effect on the aggregate consumption of all fibers, such prices have a significant bearing on the allocation of markets among fibers.

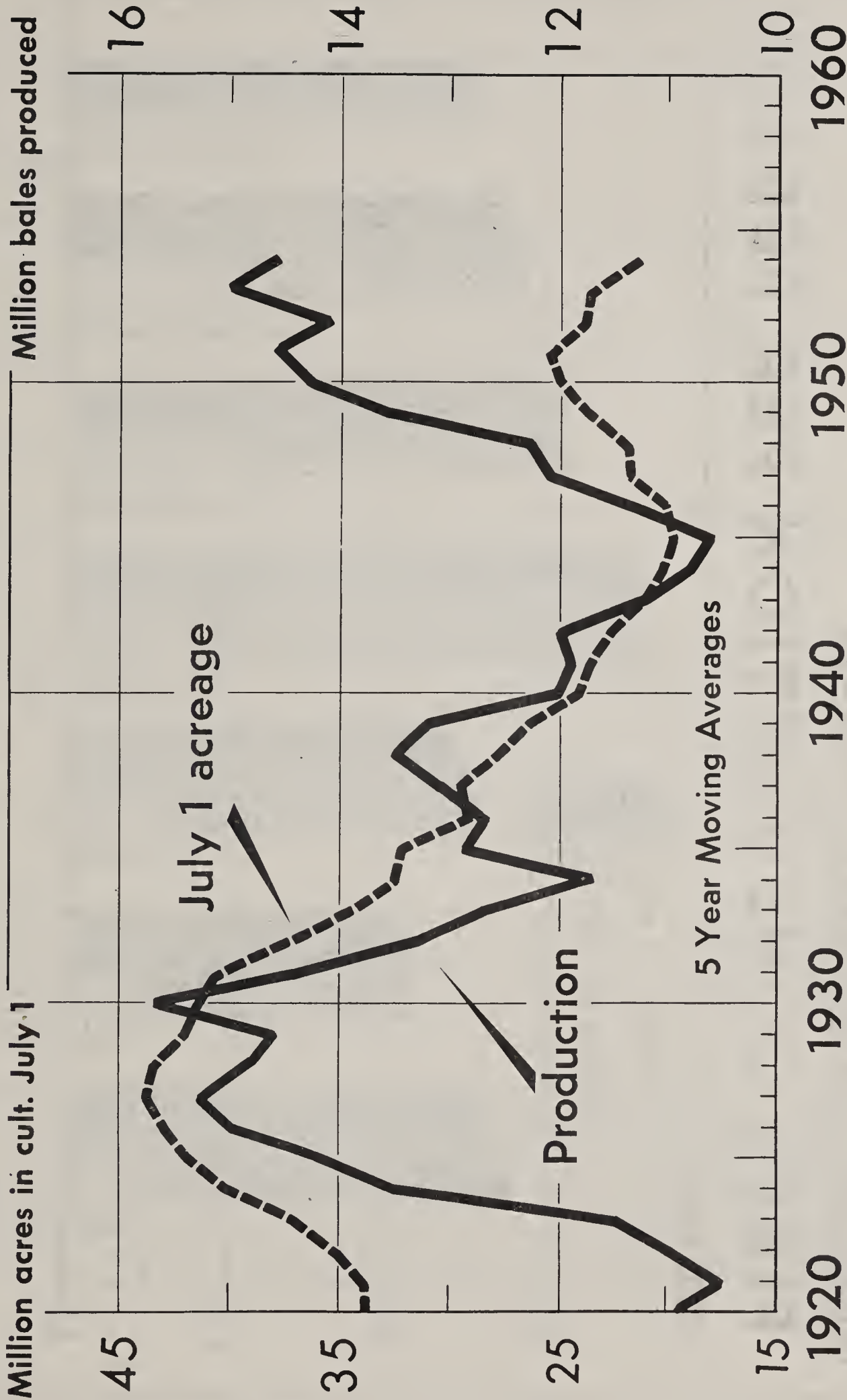
Despite the substantial decline in U. S. cotton exports from the 1920's to 1953-55, foreign consumption of cotton increased by approximately 63 percent. The gap was filled by foreign cotton, production of which was about $2\frac{1}{2}$ times as large in 1953-55 as in the 1920's. Foreign consumption of cotton would have increased even more except for the increase in foreign manmade fiber production and consumption. In 1920 manmade fiber production abroad was equivalent to about 51,000 bales of cotton. This production increased steadily, except during World War II, and in 1955 was equivalent to approximately 9.3 million bales.

There is a close correlation between prices for U. S. cotton and prices for foreign grown cotton. Even though foreign acreage of cotton has shown some tendency to increase, regardless of price, since the 1920's, higher prices tended to accelerate the rate of expansion. Foreign cotton acreage expanded about 31 percent from 1939 through 1955 and cotton prices in constant dollars rose about 70 percent from 1938 through 1954.

One important factor affecting the competitive position of U. S. cotton in world markets is the wide range of actions taken by governments of other major cotton exporting countries to expedite the exportation of their cotton. Export duties have been lowered when necessary to improve the competitive position of the growths in question. Some foreign governments also support the price of cotton. These governments sometime sell cotton for export below the prices at which cotton is supported. Some governments attempt to improve their cotton exports by barter transactions. Export bonus techniques have been used by governments of some cotton exporting countries to provide an incentive for exports. Finally, some countries at times provide for internal subsidization of cotton growers through free distribution of seed, fertilizer, and insecticides.

If these long term trends continue, U. S. cotton producers will find themselves confronted with shrinking markets that will absorb the output of fewer and fewer acres. Cotton farmers will then have to face the prospect of (1) steadily declining farm income from cotton or (2) farm income from cotton increasingly subsidized by Government cotton programs.

COTTON IN CULTIVATION JULY 1 AND PRODUCTION, UNITED STATES



U.S. DEPARTMENT OF AGRICULTURE

NEG. 3647-56(10) AGRICULTURAL MARKETING SERVICE

Figure 4

Natural and Synthetic Fibers

FIBER CONSUMPTION PER PERSON

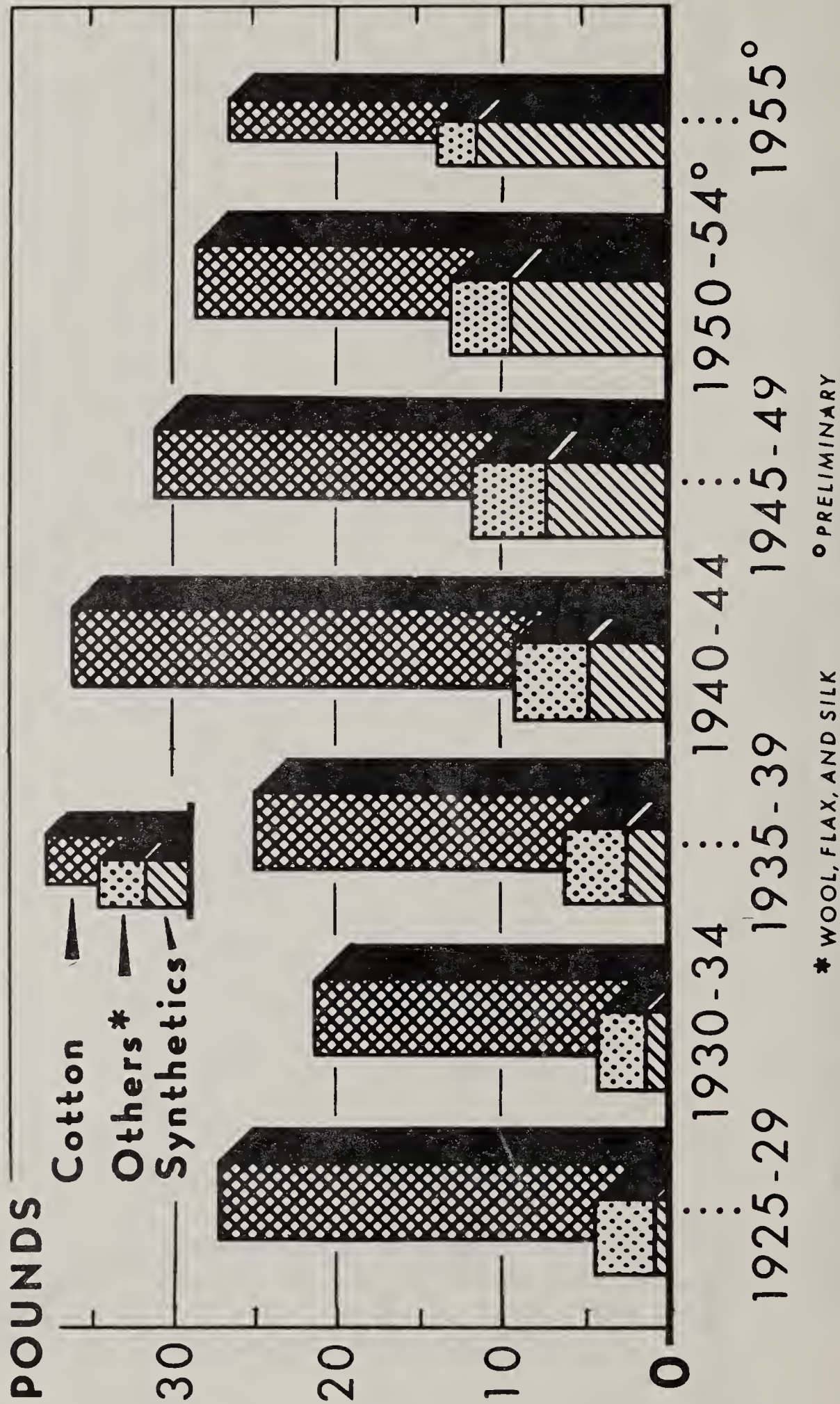


Figure 5

Section IV

Methods of Calculating Parity or Support Prices for Cotton

In this section the methods of calculating the parity or support prices for cotton requested by the Committee are described. The methods considered are:

1. Modernized parity and old parity.
2. Parity price based on the prices paid for items used in producing cotton, referred to as "Cotton's Own Parity."
3. Cotton's Own Parity modified by changes in the quantity of inputs of various kinds used to produce a pound or a bale of cotton, referred to as "Cotton's Own Parity with Efficiency Modifier."
4. Basic quality for price support purposes.

The Department will make in January 1957 a fuller and more detailed report recommending improvement in the calculation of parity.

Modernized Parity and Old Parity

The adjusted base price for Modernized Parity is calculated by dividing the average price received by farmers for cotton over the preceding 10 calendar years by the index of average prices received by farmers for all farm products (1910-14=100) for the same period. The adjusted base price for 1956 is 12.39 cents per pound. The adjusted base price is then multiplied by the Parity Index (the index of prices paid), including interest, taxes and wages, for the particular month for which the calculation is being made to obtain the parity price for that month.

To calculate the Old Parity price for cotton the base price of 12.4 cents per pound (the average price received by farmers for cotton from August 1909 to July 1914) is multiplied by the unrevised Index of Prices Paid, including taxes and interest but excluding wages, for the particular month for which the parity price is being calculated.

Old Parity maintains a fixed relationship between prices for cotton and other farm products. Modernized Parity reflects the changing relationships among prices received by farmers for cotton and other farm commodities. The changing pattern of relationships among these prices is intended to allow for relative changes in demand for various farm products and the cost of producing them. At the present (November 1956) there is little difference between Modernized and Old Parity, 35.81 and 36.21 cents per pound, respectively.

The future relationship between Modernized and Old Parity prices for cotton will depend on changes in prices received for cotton in relation to changes in prices received for other farm products. Future price support policies are among the factors that will influence prices received for cotton and other important commodities.

Some of the support systems for cotton discussed herein would cause prices received by farmers to fall substantially below those that would be received under the present support system. Although the parity prices are assumed to remain constant for illustration purposes, such systems might cause future modernized parity prices for cotton to decline.

Cotton's Own Parity

A price support system based on the prices of items used in cotton production would involve (1) calculation of an index representing the composite average of the prices for these items and (2) the application of the index to some base period cotton price. The result is referred to here as "Cotton's Own Parity."

An index representing the composite average price of items used in producing the U. S. cotton crop was developed for each year 1945 through 1955 and for 1939. Items included were labor, land, planting seed, insecticides, fertilizer, irrigation water, power and machinery and ginning. Items not included were management and general overhead.

The index was computed in the following manner. A weighted aggregate of actual prices of the production items was obtained for each year, using as weights the average quantity of each item used in 1947-49. In the development of the weights, the total quantity of each item actually employed in production was used whether or not it was usually purchased. The 1947-49 period was chosen largely because better data were available for those years than for any others. However, this period is considered representative of the postwar period before reinstitution of acreage allotments and marketing quotas.

The price index for production items was calculated by dividing the weighted aggregates for each year by that for a base year and multiplying the result by 100. To derive a parity price based only on items used in cotton production, the price index for each year was multiplied by the parity price for the same base year, as then calculated.

In addition to being an index for cotton rather than an average index for all farms, this concept differs from the present parity formula in two important respects. Items used in family living are given weights and are included in present parity calculations but not in Cotton's Own Parity calculations. The present parity formula includes and gives weight only to items which are purchased, and weights are assigned on the basis of relative importance in total purchased items. In Cotton's Own Parity full weight is given to each item even though only a part of the item is usually purchased.

Table 1 gives results of the calculation of Cotton's Own Parity in index form for selected years and for two base years. Two important comparisons can be made from these data. For the period 1945-55, with 1945 taken as a base, the index of Cotton's Own Parity changed in about the same proportion as did the Old Parity index. If such comparisons are made from the prewar base of 1939, however, it will be noted that the index of Cotton's Own Parity increased about three-fold while the Old Parity index rose only to about $2\frac{1}{4}$ times its 1939 level. This difference is due largely to the fact that labor and land account for a substantial part of the total weight in Cotton's Own Parity. Farm wage rates and farm land values have increased at a substantially greater rate since 1939 than have prices of items such as fertilizer and farm machinery.

Table 1.- Indexes of parity prices of cotton

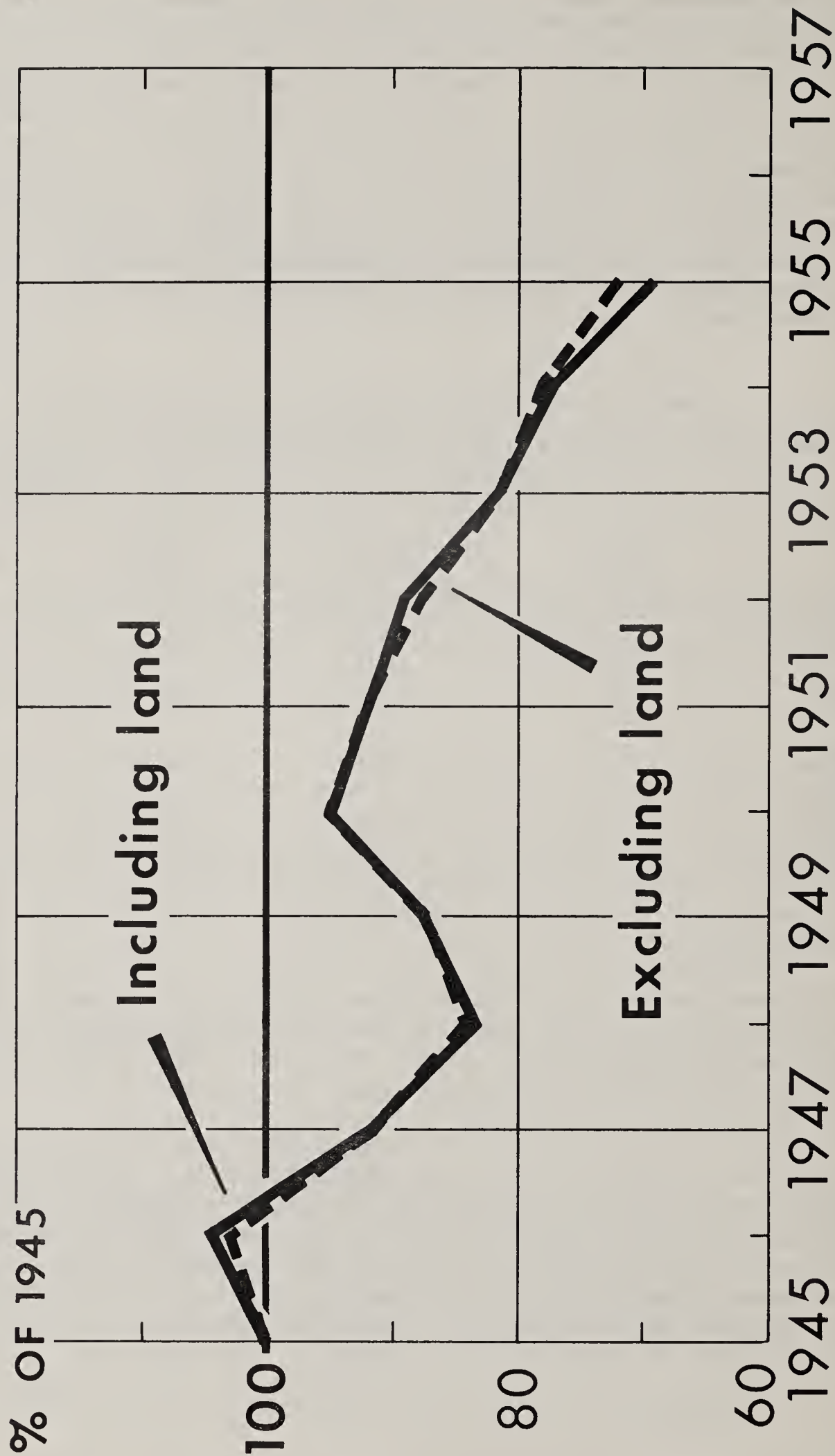
Year	1945=100		1939=100	
	Old parity	Cotton's own parity	Old parity	Cotton's own parity
1939	70	51	100	100
1945	100	100	143	196
1950	149	132	214	258
1955	159	157	228	307

Efficiency Modifier

The development of a price support system which permits the adjustment of price supports in line with changes in efficiency involves the calculation of an index of efficiency for a period of years. This index is referred to in this report as the "Efficiency Modifier."

In order to calculate the Efficiency Modifier, it was necessary to obtain estimates of the quantities of the major items used in producing the U. S. cotton crop (inputs) during each year of the 1945-55 period and for 1939. The items included are the same as those listed on page 22. The estimates of inputs relate to those actually used in cotton production each year and do not make allowance for resources that might have been unemployed in a given year because of fluctuations in the size of the cotton crop.

PRODUCTION INPUTS PER BALE OF COTTON*



U. S. DEPARTMENT OF AGRICULTURE
* PRELIMINARY ESTIMATES
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Figure 6

Production input data were obtained from several sources. The acreage of cotton planted and harvested, the total quantities of labor, fertilizer and planting seed used in producing cotton and the cost of ginning were available largely from published information. Estimates of power, machinery, irrigation and other items were developed from various local area studies and from miscellaneous sources.

An index of the quantity of physical inputs required to produce a bale of cotton for the years 1945 to 1955 and for 1939 was computed as follows. A weighted measure of the total quantity of inputs used in production was obtained for each year by applying appropriate average 1947-49 prices as weights to the quantity of each input item used in each year and summing their products. These weighted aggregates were converted to index numbers by dividing the total for each year by the total for a base year and multiplying by 100. An index of the number of bales of cotton produced was also calculated. The index of quantity of inputs was divided by the index of bales produced to derive an index of quantity of inputs per bale of cotton, called the Efficiency Modifier.

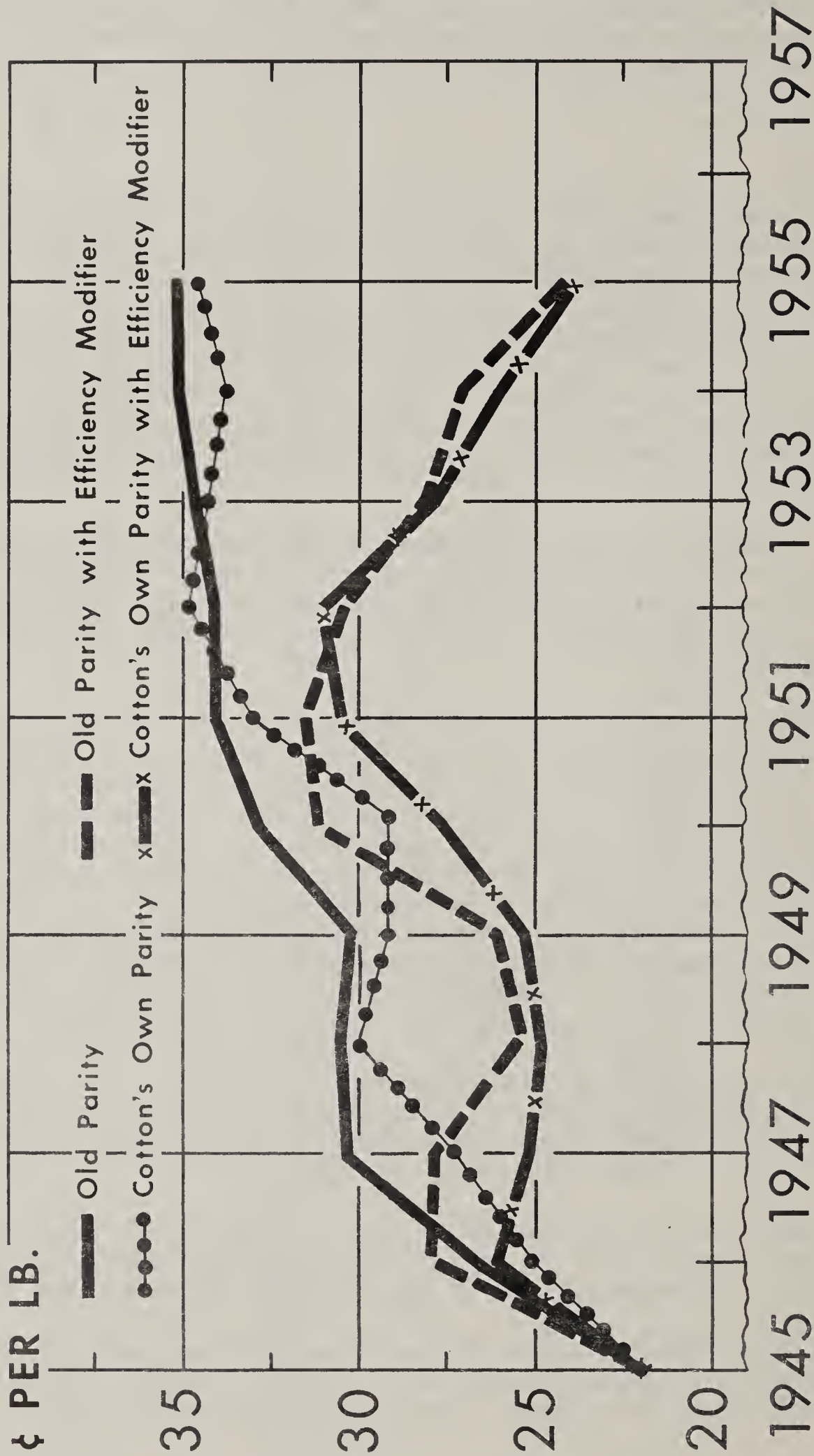
The results of these calculations using the year 1945 as a base are given in figure 6. In general, there has been a sharp decrease in inputs per bale and they were 30 percent less in 1955 than in 1945. The inclusion or exclusion of land as an input had relatively little effect on the index during the 1945-55 period.

A trend line fitted to the data shown in figure 6 indicates that the quantity of inputs per bale of cotton has decreased at an average rate of about 3 percent per year from 1945 to 1955. Figure 7 shows the parity price for cotton that would result from use of Cotton's Own Parity and the Efficiency Modifier during the 1945-55 period. As indicated above, the use of Cotton's Own Parity (1945=100) would have resulted in substantially the same parity prices for cotton in most years as those resulting from the use of Old Parity. (See table 1.) In this instance the Old Parity price for 1945 and Cotton's Own Parity for 1945 were assumed to be the same. The application of the Efficiency Modifier (1945=100) to the Old Parity price of cotton and to Cotton's Own Parity would have reduced the parity price of each substantially during most of the years considered. For example, if in 1955 the Efficiency Modifier were multiplied by the Old Parity price and by Cotton's Own Parity, respectively, resulting prices would be about 24.2 and 23.9 cents a pound. Without use of the Efficiency Modifier, Cotton's Own Parity would have been about 34.6 cents in 1955. Old Parity in 1955 was 35.1 cents per pound.

Limitations of available data largely circumscribe the accuracy with which estimates can be made of either the Efficiency Modifier or Cotton's Own Parity. This is especially true of estimates for years earlier than 1945.

Even with basic data regarded as adequate, the analysis indicates that the choice of the base period can result in a considerable difference in the parity price for any given year. For example, if the year 1939 were used as a

ILLUSTRATIONS OF ALTERNATIVE PARITY PRICES OF COTTON



U. S. DEPARTMENT OF AGRICULTURE

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Figure 7

base, Cotton's Own Parity price in 1955 would be about 47.2 cents per pound and if an adjustment were made for increased efficiency the adjusted 1955 parity price would be about 30.2 cents per pound. Old Parity in 1955 similarly adjusted would be about 22.5 cents per pound.

If the Efficiency Modifier is to be used as a device in calculating the parity price for cotton, some technique such as a moving average or other method for measuring trend would be needed to take into account wide year-to-year variations resulting from differences in weather and other growing conditions. Data to compute the Efficiency Modifier for the current crop would not be available for use in the support price calculation for that crop. The use of the preceding year's data might cause a support price to be calculated which would reflect more or less change in efficiency than actually occurred.

Use of the Efficiency Modifier would raise questions as to how gains in efficiency should be shared between cotton producers and consumers. Changes in the efficiency of cotton production vary among areas and farms. Application of an Efficiency Modifier that would be based on changes in average efficiency would have differential effects on net incomes of cotton producers. Many producers who can attain less than average gains in production efficiency would be adversely affected. It should be noted, however, that any reduction in the national support price which is based on averages or in free market prices would also raise severe problems for inefficient producers. This may mean that other programs would be needed to assist inefficient producers to make adjustments.

Base Quality for Price Support Purposes

Under present legislation middling 7/8 inch is designated as the standard grade of cotton for price support purposes. This means that the announced support rate becomes the average rate for middling 7/8 inch with premiums and discounts for other qualities. Because the average quality of the crop is higher than middling 7/8 inch, the average rate received by farmers for their cotton based on support prices will be above the rate for middling 7/8 inch and above the announced support level. If the quality differentials for the 1956 CCC loan program and the average quality distribution of the 1950-54 crops are used, the loan rate for the entire crop would average about 1.6 cents per pound higher than the loan rate for middling 7/8 inch. For farm products other than cotton the parity price and support rate relate to the average of all grades and classes rather than to a specific quality.

If the legislation were changed to provide that the level at which cotton is supported should apply to the average quality of the crop rather than middling 7/8 inch cotton, the loan rate would be lowered. The effect on disappearance and production would be the same as lowering the percentage of parity at which cotton is supported by a corresponding amount while leaving the base quality at middling 7/8 inch.

Section V

Alternative Systems of Price Support

This section describes several alternative systems of price support and summarizes their economic effects as estimated for 1960. These effects are tabulated and compared in Section VI entitled "Estimated Economic Effects of Alternative Cotton Price Support Systems." Also compared in that section are longer-term effects where it is believed that the relative position of the several systems with respect to these effects might be somewhat different from 1960 estimates. The bases for ascertaining these effects are discussed in detail in the Appendix.

The systems of supporting cotton prices which are discussed in this report are:

1. Cash Export Subsidy.
2. Sale of CCC Stocks for Export.
3. Certificate Plan and Processing Tax Plan.
4. International Cotton Agreement.
5. Ninety Percent of Parity (Modernized Parity).
6. Flexible Support Price System (Modernized Parity).
7. Seventy-five Percent of Parity (Modernized Parity).
8. Ninety Percent of Cotton's Own Parity.
9. Cotton's Own Parity with 50-Percent Efficiency Modifier.

The economic effects of each system for 1960 are summarized under six categories as shown below:

1. Size of disappearance.
2. The size of the acreage reduction below uncontrolled acreage required by each system to balance production and disappearance.
3. Cost to the Government of each system.
4. The farm value of the crop (lint only).
5. Value of the crop less the cost to the Government.
6. Net farm income.

In order to ascertain the economic effects of the various alternative programs, analysis of each system was made, assuming each system to be put into effect in 1957 and kept in effect throughout the projection period.

Various Two-Price Systems of Price Support and
Marketing Which Could be Made Applicable to Cotton

Although the committee directed the Department to study "two-price" systems, it did not define the term. Actually, there are many different definitions of two-price systems. This section of the report considers several alternative methods of supporting cotton prices or supplementing the returns of cotton growers. Some of the programs described in this section are not two-price plans according to many definitions. The plans described would provide lower prices for cotton in export markets than the prices charged domestic users. The first four systems listed above are discussed under two-price systems.

With the exception of an International Cotton Agreement all the systems discussed herein might be considered by foreign countries as unilateral dumping systems. Cotton importing countries might not object because they would be able to buy cotton at lower prices; but cotton exporting countries might take retaliatory action, particularly if the system should result in the U. S. obtaining what these countries considered to be a larger than fair share of the world market. Some of these exporting countries are important in the international security system of the United States, for example, Turkey and Pakistan. Even cotton importing countries might take exception to such systems if they thought that the adopted system indicated a shift in general United States international trade policy for other agricultural commodities and, perhaps, for industrial products. The initiation of such a system could precipitate a movement toward tighter restrictions on international trade by foreign countries.

Except for the International Cotton Agreement all of the four systems might be considered unilateral dumping by other countries; but the systems that most clearly fall into such a classification are the Cash Export Subsidy and the CCC Sale of Stocks for Export. The Certificate and Processing Tax Plans could be considered a domestic subsidy to cotton producers.

Cash Export Subsidy.— Under a Cash Export Subsidy system the domestic price for cotton would be supported by a Commodity Credit Corporation loan. Exporters of cotton could receive a subsidy in cents for each pound of cotton exported which would be equal to the difference between the support or market price and an export price objective.

If 90 percent of parity were used as the domestic price and the difference between 90 percent and 65 percent of parity times the parity price were used to calculate the export subsidy, the farm price would be about 32 cents

per pound for Middling 7/8-inch cotton and the export subsidy rate would be 8.9 cents per pound or about \$44.50 per bale. If the domestic price were 80 percent of parity, the farm price would be about 28.4 cents per pound and the export subsidy would be about 5.3 cents per pound or about \$26.50 per bale. In this report, 90 and 65 percent of parity and 80 and 65 percent of parity are used for purposes of illustration.

Though the Cash Export Subsidy system is fairly straightforward in its operation, it has some complicating factors. Since the end of World War II the United States has exported more than 500,000 bales of cotton a year in the form of manufactured textiles. With American cotton made available at a lower price to foreign mills than to domestic mills, domestically produced cotton textiles would be at a competitive price disadvantage, as compared with cotton textiles produced abroad. As is currently being done, this problem could be solved by paying an "equalization fee" on the cotton content of manufactured textile items exported from the U. S. The payment for textiles would have to be made to the textile exporter as the textile manufacturer often does not know if his product will be exported or consumed domestically when he sells it.

The U. S. also imported cotton textile items in the post-World War II years, but in considerably smaller quantity than cotton textile exports. The sale of American cotton at lower prices to foreign mills than to domestic mills might place foreign mills in a somewhat more favorable position in competing with their domestic counterpart in the U. S. If their exports were to increase sharply, it might be desirable either to limit the amount of cotton textiles imported into the U. S. or to impose an import equalization fee upon them.

The limitation of imports would be difficult to administer. Import quotas on cotton textiles would require quantitative limits on many diversified products from several countries. It is doubtful if adequate data are now available for imposing and administering such quotas on many of these products.

The comparisons of the economic effects of the various support systems, shown in Section VI, assume that the cotton textile export and import problems under the Cash Export Subsidy system would be satisfactorily solved.

The estimated economic effects of the Cash Export Subsidy system under the assumptions and approach explained in Section VI and in the Appendix are:

1. Disappearance in 1960 probably would be about 14.2 million bales with a domestic price objective of 90 percent of parity and about 14.7 million with a domestic price objective of 80 percent of parity.

2. To balance production and disappearance under the domestic price objective of 90 percent of parity, an acreage reduction below uncontrolled acreage of about 8.5 million acres would be required in 1960. Under the 80 percent domestic price objective the required acreage reduction is estimated at about 6.8 million acres.

3. The cost to the Government in 1960 with a domestic price objective of 90 percent of parity would be about 0.3 billion dollars and about 0.2 billion with a domestic price objective of 80 percent of parity.

4. The value of the crop would be about 2.3 billion dollars in 1960 with a domestic price objective of 90 percent of parity and about 2.1 billion with a domestic price objective of 80 percent of parity.

5. The value of the crop less the cost to the Government in 1960 with a domestic price objective of 90 percent of parity would be approximately 2 billion dollars and about 1.9 billion with a domestic price objective of 80 percent of parity.

6. Net farm income in 1960 under a 90 percent domestic price objective would be about 1.8 billion dollars and about 1.6 billion under an 80 percent domestic price objective.

Sale of CCC Stocks For Export.- Under this system the Commodity Credit Corporation would sell stocks of cotton which it owned for export at a lower price than the domestic market price or the loan rate available to farmers. The price for export cotton would reflect the CCC sales price for export and the price for cotton consumed domestically would reflect the loan rate or market price to farmers. This system has been in effect for cotton exports during the 1956-57 marketing year; it was also used to a limited extent in 1955-56. For the 1956-57 season, the differential between the market price (or CCC loan rate) and the CCC sales price for export cotton has been about 6.5 cents per pound.

During the past several years cotton has been sold abroad mostly at the 90 percent support level. For the last two years cotton has been sold abroad for foreign currencies under the Agricultural Trade Development and Assistance Act of 1954 and for foreign products under barter contracts. In spite of these programs, the volume of exports declined to 3.4 million bales in 1954-55 and still further to 2.2 million bales in 1955-56. Exports in 1955-56 were the second smallest of any peacetime year since 1871.

The Agricultural Act of 1956 required that upland cotton from Commodity Credit Corporation stocks be made available for export at prices in line with prices of foreign cotton. Under the current export program, exports have increased substantially, and are expected to be about 6.5 million bales in the 1956-57 marketing year. As of December 14, 1956, the Commodity Credit Corporation had sold about 6.2 million bales for export in 1956-57. Undoubtedly the low price at which export cotton is being sold by CCC has been effective in stimulating exports, but much of the increase is due to the replenishment of cotton stocks abroad, an increase in foreign cotton consumption of up to a million bales above 1955-56, and the lack of a substantial increase in foreign cotton production. The cotton carryover in the foreign free world was about 2 million bales smaller on August 1, 1956 than a year earlier. The decline in foreign stocks occurred because importers abroad restricted their imports from the United States in

anticipation of the drop in United States export prices. The recent high levels of economic activity abroad have caused foreign free world cotton consumption to increase. Although yields per acre of cotton increased over 1955-56 in 1956-57, cotton acreage in the foreign free world declined for the first time since the end of World War II. Foreign free world cotton production is estimated to be only about 100,000 bales larger in 1956-57 than in 1955-56.

Since exporters could buy cotton from CCC cheaper than on the open market, all cotton exports probably would move through CCC thus limiting the handling of cotton by cotton merchants. This is in contrast to the Cash Export Subsidy system under which all cotton, for export or otherwise, could move through commercial channels.

As CCC does not take ownership of current crop loan stocks until after the end of the current marketing year, all sales for export would come from previous crops. The quantity of the current crop that would move exclusively through non-Government marketing channels would be about equal to domestic mill consumption. Since the current crop probably would be larger than domestic mill consumption, the prices received by farmers probably would be close to the CCC loan rates. When CCC sold cotton for export it would absorb any losses.

For the purpose of determining the economic effects of the Sale of CCC Stocks for Export system in 1960, two alternative assumptions are made with respect to the export sales price and the domestic price. The first assumes an export price objective of 65 percent of parity and a domestic price objective of 90 percent of parity; the second assumes price objectives of 65 and 80 percent of parity, respectively. It is further assumed that the cotton was acquired by CCC at the domestic price objectives which were the loan rates in an earlier year and acquisition costs were added. Thus every bale exported would cost the Government about 51 or 33 dollars per bale depending upon the domestic price objective. This assumes also that cotton is sold for export by CCC on the date it is acquired. Actually CCC may hold the cotton for some **time after acquisition**. **Therefore, the per bale cost** shown above is actually a minimum cost.

The same problems connected with the export and import of cotton textiles exist under both the Cash Export Subsidy system and the Sale of CCC Stocks for Export system. (See page 30.) Also, the comparison of the economic effects of the various support systems shown in Section VI assumes that the cotton textile export and import problem under the Sale of CCC Stocks for Export system would be resolved.

The estimated economic effects of the Sale of CCC Stocks for Export system under the assumptions and approach explained in **Section VI and the Appendix** are the same as those for the Cash Export Subsidy system with respect to disappearance, the acreage reduction required to balance production and disappearance, farm value of crop, net farm income, and cost to Government.

Certificate Plan and Processing Tax Plan.- The Certificate Plan and the Processing Tax Plan are considered together because their essential difference lies only in the manner in which funds to be paid to producers on their domestic marketing quota would be collected.

Under the Certificate Plan each cotton grower would be given a total crop acreage allotment representing his share of both the export and domestic markets. He also would be given a domestic marketing quota in pounds or bales representing his share of the domestic market. If he did not exceed his cotton acreage allotment he could place his cotton in a Commodity Credit Corporation loan and he would be eligible to receive marketing certificates covering his domestic marketing quota. These certificates could have a redemption value equal to the smaller of (1) the difference between the domestic price objective and the loan rate or (2) the difference between the domestic price objective and the market price. For example, the domestic price objective might be set at 90 percent of parity and the export price objective at 65 percent of parity. If the market price were the same as the export price objective, the value of the certificate would be $90-65=25$ percent of parity. If the domestic price objective were 80 percent of parity, the value of the certificates would be 15 percent of parity. These are the situations assumed for purposes of illustration in this report.

The cotton grower would sell his certificate either along with his cotton or separately. Domestic spinners would be required to buy certificates for each bale of cotton used to produce textiles for the domestic market. Exporters of textiles made from American cotton would receive a rebate for the cost of the certificates covering the quantity of cotton used in manufacturing the exported textiles. Importers of textiles would buy certificates for the quantity of cotton used in manufacturing the imported textiles.

In order to prevent speculation in certificates it probably would be necessary to establish some centralized method for buying and selling the certificates. This could be done through banks and the Federal Reserve System. Certificates would be bought and sold at fixed prices. Another method would be to have all sales and purchases of certificates move through, or be registered with, the Commodity Credit Corporation. In any event, the sale and purchase of certificates would require some paper work and administrative detail.

Under a Processing Tax Plan there would be no certificates. Domestic mills would pay a processing tax on each pound of cotton processed. The processing tax would be equal to the value of the certificates as described previously. The Government would use the processing tax collections to reimburse farmers for the difference between the domestic price objective and the loan rate or market price. Exporters of cotton textiles would receive a rebate for the processing tax for the amount of cotton used to manufacture the exported textiles. Importers of cotton textiles would pay a processing tax on the amount of cotton used to manufacture the imported textiles.

From an administrative viewpoint, the Processing Tax Plan would be

simpler to operate than the Certificate Plan. It would involve less paper work.

Under the Certificate and the Processing Tax Plans the cost of certificates or the tax would be borne immediately by the cotton spinner. Eventually a large part of the cost probably would be passed on to the domestic consumer of textiles in the form of higher prices. Thus, the cost of the certificates or tax would be borne by the user of cotton textiles rather than by the taxpayers. Under the other two-price systems discussed herein all taxpayers would bear the cost.

The estimated economic effects of the Certificate and Processing Tax Plans under the assumptions and approach explained in Section VI and the Appendix are:

1. Disappearance in 1960 with a domestic price objective of 90 percent of parity would be about 14.2 million bales and with a domestic price objective of 80 percent of parity it would be about 14.7 million bales.

2. To balance production and disappearance in 1960 acreage reductions below uncontrolled acreage of about 7.1 million acres would be required with a domestic price objective of 90 percent of parity and about 6.1 million acres with a domestic price objective of 80 percent of parity.

3. The cost to the Government in 1960 would be less than 0.05 billion dollars.

4. The value of the crop in 1960 with a domestic price objective of 90 percent of parity would be about 2 billion dollars and with an 80 percent of parity domestic price objective it would be about 1.9 billion dollars.

5. The value of the crop less the cost to the Government in 1960 would be about 2 billion dollars with a domestic price objective at 90 percent of parity and about 1.9 billion dollars with a domestic price objective at 80 percent of parity.

6. Net farm income in 1960 would be about 1.6 billion dollars with a domestic price objective at 90 percent of parity and about 1.5 billion dollars with a domestic price objective at 80 percent of parity.

International Cotton Agreement.- Basic types of international commodity agreements are:

1. Multilateral contract
2. International trade quotas
3. Buffer stocks.

Several combinations can be derived from these basic types. One of the basic types, a multilateral contract, is discussed here; it is similar to the International Wheat Agreement.

The objectives of this type of agreement are to give importing countries supply assurance and exporting countries market assurance at prices that are considered fair to producers and consumers. Within the framework of guaranteed quantities and prices, the agreement provides assured supplies for importing countries at a specified maximum price and an assured market to exporting countries at a specified minimum price. This type of agreement does not prescribe the means or methods to be used by participating countries to insure fulfillment of their contractual obligations, but it is designed to avoid interference with private trade and with the internal policies and programs of the countries involved.

The agreement does not of itself control production or limit trade, and it does not impede the free movement of prices within the guaranteed price range. In other words it does not interfere with the operation of market forces except when prices reach predetermined limits and then only as far as guaranteed purchases and sales are concerned.

The total of the guaranteed purchases of the importing countries and the total of the guaranteed sales of the exporting countries are equal. Any disparity between these totals that might develop is reestablished by an agreed adjustment procedure. All transactions among participating countries within the specified range between the maximum and minimum prices are counted as fulfillment of guaranteed purchases and sales. Exporting countries are not obligated to sell at less than the agreed maximum price, and importing countries are not required to buy at prices above the minimum.

Provided they fulfill their obligations under the agreement, participating exporting countries remain free to sell over and above the quantity guaranteed in the agreement to any participating or nonparticipating country at any price; and participating importing countries remain free to buy over and above the guaranteed quantity from any source at any price. Thus, two prices (the agreement price and a higher or lower market price) can exist at the same time.

This type of agreement results in multiple pricing only when the market price rises above or falls below the agreement price range. Conceivably, a maximum price could be established so high and a minimum price so low that market prices would always fluctuate within the range.

At the other extreme, a contract type of agreement, if combined with a domestic support program, might result in a "three-price" system. For example, the free world price might be above the maximum agreement price with the domestic price at an even higher level.

There are many problems to be faced in connection with the administration of the International Cotton Agreement. These include (1) the varying quantities of the wide range of qualities of cotton used in the world, (2) the implications of the agreement to exporting countries when prices rise to the maximum and to importing countries when prices fall to the minimum

permitted by the agreement, (3) the implications of international trade in cotton textiles, and (4) foreign exchange problems.

The possibility of developing an international agreement has been explored and it appears slender indeed. The principal and vexing problems center around the development of quotas which are mutually satisfactory to all countries, both importing and exporting. Since the possibility of concluding an agreement is remote, additional space is not devoted to discussing the numerous technical and administrative complications which would arise in connection with the negotiation and administration of such an agreement, nor is an analysis made of the economic effects. However, if the United States unilaterally adopts a two-price system of another type, other countries might find an International Cotton Agreement more attractive in the future than they have in the past.

Systems of Cotton Price Support Other Than Two-Price Systems

Ninety Percent of Parity.— Under the 90 Percent of Parity system there would be a CCC loan available at 90 percent of the parity price for cotton. A national marketing quota and a national acreage allotment would be established to bring production and disappearance into balance. Each farmer would receive an acreage allotment which would be his share of the national allotment. As long as the farmer did not exceed his acreage allotment, he would be eligible to place his cotton in the CCC loan. If he exceeded his acreage allotment, he would be subject to a penalty of 50 percent of the parity price on all cotton produced from the excess acreage.

In this report it is assumed that cotton would sell in the market for 90 percent of parity. This is predicated on the relatively heavy stock position which it is assumed would characterize this system in 1960 and the resulting likelihood that the market price would not be significantly different from the loan rate. (See pages 41 and 42.)

The estimated economic effects of the 90 Percent of Parity system under the assumptions and approach explained in Section VI and the Appendix are:

1. Disappearance in 1960 would be about 11.4 million bales.
2. To balance production and disappearance acreage reductions below uncontrolled acreage of about 11.7 million acres in 1960 would be required.
3. The cost to the Government in 1960 would be less than 0.05 billion dollars.
4. The value of the crop in 1960 would be about 1.8 billion dollars.
5. The value of the crop less the cost to the Government in 1960 would be about 1.8 billion dollars.
6. Net farm income in 1960 would be about 1.6 billion dollars.

Flexible Support Price System.- Under the Agricultural Act of 1949 a flexible support price system for cotton was authorized. When the total supply of cotton exceeds 108 percent of the normal supply, the percentage of parity used to determine the minimum support price declines from 90 percent, and reaches a minimum level of 75 percent when the supply exceeds 130 percent of normal. The various percentages of parity at which cotton is supported when the actual supply exceeds 108 percent of normal is shown in the following table:

When actual supply is the following percent of normal supply:	The level of support shall be not less than the following percentage of the parity price:
---	--

Not more than 108	90
More than 108 but not more than 110	89
More than 110 but not more than 112	88
More than 112 but not more than 114	87
More than 114 but not more than 116	86
More than 116 but not more than 118	85
More than 118 but not more than 120	84
More than 120 but not more than 122	83
More than 122 but not more than 124	82
More than 124 but not more than 125	81
More than 125 but not more than 126	80
More than 126 but not more than 127	79
More than 127 but not more than 128	78
More than 128 but not more than 129	77
More than 129 but not more than 130	76
More than 130	75

Although this system is called a flexible support price system, it actually has little flexibility. The formula for cotton and peanuts differs from that for other basic commodities whose minimum support levels decline below 90 percent of parity when the supply percentage exceeds 102 percent rather than 108 percent of normal. Marketing quotas and acreage allotments to restrict production of cotton are required when the actual supply exceeds 100 percent of normal but the support price does not start to flex until the actual supply exceeds 108 percent of normal. Thus when supply is only moderately excessive, as defined by the normal concept, principal reliance is placed on production controls to reduce the supply. Lower support prices to help bring production and disappearance into balance are not initiated until the actual supply becomes markedly larger than normal. In recent years, the rapid increase in yields has made marketing quotas and acreage allotments largely ineffective in reducing the actual supply. Other modifications of the support system have been enacted into law which tend to keep the support price close to 90 percent of parity.

In the Agricultural Act of 1954 a commodity set-aside for cotton was authorized in which the Secretary of Agriculture was required to place 3 to 4 million bales of cotton. Cotton included in the set-aside is also included in calculating actual supply to compute marketing quotas and acreage allotments, but the set-aside is not included in the actual supply for purposes of computing the level of price support for cotton. This use of the set-aside has the effect of keeping the support price high relative to the marketing quota and acreage allotment level. However, the actual supply for the 1955-56 marketing year was so large that even with the set-aside exclusion a minimum support level for the 1956 crop of 75 percent of parity was indicated. The actual support level was set at 82.5 percent of parity.

Additional provisions in the Agricultural Act of 1956 were designed to reduce the supply or production of cotton and thus keep the support price at a high level. The minimum acreage allotment for 1957 and 1958 was pegged at the 1956 level of 17.4 million acres. However, the Soil Bank Act, included in the Agricultural Act of 1956, provides for payments to cotton producers of up to 300 million dollars per year for reducing actual acreage below their acreage allotments for the 1956, 1957, 1958 and 1959 crops. If effective, this Act will reduce production and supplies, thus raising the support level.

If the flexible system were operated so that it held the support price level at or close to 90 percent of parity, its effects would not differ significantly from those of the fixed 90 Percent of Parity system shown on page 36.

If a flexible system were operated so that the support level declined to the minimum allowed--in this case 75 percent of parity--its effects would be quite different from the fixed 90 Percent of Parity system and would approximate those for a 75 Percent of Parity system, described below.

Instead of the present 75 to 90 percent flexible support system, the Congress might authorize a program for cotton similar to programs now in operation for the mandatory non-basic commodities. Support might be authorized at such a level between 60 and 90 percent of parity as would bring about a balance of production and market purchases for domestic consumption, export, and inventory without production controls. Such a program would not affect the average level of cotton prices significantly over a period of years. It would be mainly a program to stabilize cotton prices. The Commodity Credit Corporation would still stand ready to make loans whenever there was excess production. However, presumably the inventory of the Commodity Credit Corporation would usually be low and often might be non-existent.

It would obviously be difficult to estimate accurately what price would bring a balance between production and disappearance without production controls. This is simply because the cotton industry has now operated for almost 25 years under price supports and intermittent acreage controls. Perhaps production and disappearance would be approximately in balance in 1960 without production controls if cotton prices averaged about 60 percent of parity

over the next few years. In the more distant future, the balance might be at about 70 percent of parity, primarily because lower prices over a period of years would contribute to the growth of markets.

Seventy-five Percent of Parity.- The Seventy-five Percent of Parity system would operate in much the same way as the Ninety Percent of Parity system except that the support price would be set so that the average price received by farmers would be about 75 percent of parity. Domestic mills and importing countries alike would pay a price equivalent to about 75 percent of parity.

The estimated economic effects of the 75 Percent of Parity system under the assumptions and approach explained in Section VI and the Appendix are:

1. Disappearance in 1960 would be about 14.4 million bales.
2. To balance production and disappearance acreage reductions below uncontrolled acreage in 1960 of about 6.6 million acres would be required.
3. The cost to the Government in 1960 would be less than 0.05 billion dollars.
4. The value of the crop in 1960 would be about 1.9 billion dollars.
5. The value of the crop less the cost to the Government in 1960 would be about 1.9 billion dollars.
6. Net farm income in 1960 would be about 1.5 billion dollars.

Cotton's Own Parity.- Under a support system based on Cotton's Own Parity, calculated as described on page 22, cotton would be supported at 90 percent of Cotton's Own Parity price. Otherwise the system would operate exactly the same as the 90 Percent of Parity system.

The estimated economic effects of this system under the assumptions and approach explained in Section VI and the Appendix are:

1. Disappearance in 1960 would be about 11.9 million bales.
2. To balance production and disappearance acreage reductions below uncontrolled acreage of about 10.8 million acres in 1960 would be required.
3. The cost to the Government in 1960 would be less than 0.05 billion dollars.
4. The farm value of the crop in 1960 would be about 1.9 billion dollars.

5. The value of the crop less the cost to the Government in 1960 would be approximately 1.9 billion dollars.

6. Net farm income in 1960 would be about 1.6 billion dollars.

Cotton's Own Parity with Efficiency Modifier.- As indicated in the discussion of the calculation of the Efficiency Modifier, the efficiency of producing cotton is affected markedly by conditions over which man has little or no control, such as weather and insects. In addition, there is the question of how gains in efficiency should be distributed, such as between the farmer and the consumer.

The support system used in this report passes on half of the gain in efficiency in the form of lower support prices and keeps half in the support price. It is assumed that rate of increase in efficiency which prevailed from 1945 to 1955 will prevail through 1960, close to 3 percent a year from the 1945 base.

Cotton's Own Parity was then multiplied by an efficiency index which used half of the rates of gain in efficiency described above. The result of this calculation was assumed to be the price which farmers would receive for cotton.

The estimated economic effects of Cotton's Own Parity with a 50-Percent Efficiency Modifier system under the assumptions and approach explained in Section VI and the Appendix are:

1. Disappearance in 1960 would be about 14.5 million bales.

2. To balance production and disappearance acreage reductions below uncontrolled acreage of about 6.4 million acres in 1960 would be required.

3. The cost to the Government in 1960 would be less than 0.05 billion dollars.

4. The farm value of the crop in 1960 would be about 1.9 billion dollars.

5. The value of the crop less the cost to the Government in 1960 would be approximately 1.9 billion dollars.

6. Net farm income in 1960 would be about 1.4 billion dollars.

Section VI

Estimated Economic Effects of Alternative Cotton Price Support Systems

In this section the estimated effects of the alternative cotton price support systems in 1960 on specified economic factors relating to the cotton industry are compared. In addition, some indication of the relationship among the systems in the more distant future is given if it is believed that their relative position might be somewhat different from that estimated for 1960.

Assumptions and Economic Relationships

In estimating the effects of each system, certain basic economic demand and production relationships are used. These relationships are based in part on results of research. For some relationships significant results from research are not available. In such cases the judgment of various specialists in the Department of Agriculture was used. Furthermore, assumptions had to be made with respect to probable levels of several over-all economic factors in 1960 that, although essentially independent of the cotton industry, are important determinants of its economic future. These assumptions are:

U. S. Personal disposable income per person	1700 Dollars
U. S. Population	180 Million people
U. S. Consumers price index (1947-49 = 100)	114.5
U. S. Wholesale price index (1947-49 = 100)	110.7
Foreign population	2600 Million people
International conditions-constant	

In addition to the foregoing, several assumptions were made with respect to factors more closely related to the cotton industry. It is assumed that each system is introduced in 1957 and maintained throughout the projection period. An effective Soil Bank program through 1959 from the standpoint of decreasing cotton production is assumed. With such a development, the carryover of cotton probably would be reduced by August 1, 1960 from the 12.3 million bales estimated for August 1, 1957. The extent of the reduction would depend upon the support system assumed to be in effect. For example, under the 90 Percent of Parity system the 1960 carryover probably would be around 10 million bales, whereas under the Certificate Plan it would probably be about 5 million bales. These differences would result largely because of probable differences in the size of disappearance under each system.

Partly as a result of the lower stocks, market prices for cotton under most systems probably would be above loan rates by varying amounts. The extent of the difference would depend on the relation of supply to disappearance estimated for these systems. For example, with a carryover of 5 million bales and a disappearance of about 14.7 million as indicated under the Certificate Plan, the supply would be smaller in relation to demand than under the 90 Percent of Parity system with a carryover of 10 million bales and disappearance of approximately 11.4 million. It would be expected that the difference between the market price and the loan rate would be larger under the former system than under the latter.

It follows, therefore, that, if the price objectives indicated in connection with each system are to be achieved, for most of the systems they would be associated with loan rates at somewhat lower levels. In the case of the two 90 percent systems, however, the carryovers are so large in relation to disappearance that market prices and loan rates probably would be very nearly the same. Under the sale of CCC Stocks for Export system, cotton owned by CCC and, therefore, stocks acquired by CCC from crops prior to the current season would be used to fill export requirements. The quantity of cotton equal to exports from the current crop would move directly to CCC. The demand by mills in relation to the current crop would not be large enough to cause the market price to be significantly different from the support rate.

In computing the cost to the Government under the various systems, the assumption was made that acreage allotments can be operated so as to balance production and disappearance in 1960. Thus, the cost to the Government as estimated in this report does not include any costs that would arise from production excesses. It is a well known fact, however, that balance between production and disappearance even with acreage allotments has not prevailed in the recent past. Production from the number of acres specified in the acreage allotments exceeded the national marketing quota by an average of about 4.1 million bales in 1954 and 1955. This has occurred because the yield used in computing the national acreage allotment has been an historical 5 year average while actual yields have shown a sharp upward trend. (See figure 3.) In order to balance production and disappearance it probably would be necessary to compute acreage allotments in a different manner. One method of adjusting the acreage allotments so that production would tend to be more in line with marketing quotas would be to adjust the 5 year historical average yields upward on the basis of recent trends. Thus a higher yield than the simple 5 year average would be used to compute acreage allotments.

The acreage response to price used to estimate the acreages in 1960 shown under the various systems are explained in the Appendix, page 54. There is very little statistical evidence with respect to the magnitude of the response of acreage to price. However, it is possible that the response may be different at different price levels and for different periods of time. For all systems, the average return to farmers in 1960 is estimated at 75 percent of parity or higher.

Other important assumptions were also made. It was assumed that restrictions on cotton textile imports can be successfully operated under the Cash Export Subsidy and the Sale of CCC Stocks for Export systems. Also it was assumed that there would be no export programs other than those specifically mentioned in connection with each system. For example, there would be no export programs under the 90 Percent of Parity system.

It was assumed that with effective production controls in the United States world supply and demand would be in balance at the U. S. export price assumed under each system. It was also assumed that, as has generally prevailed in the past, foreign prices for cotton would tend to move parallel to U. S. prices for cotton within reasonable limits. As the prices for foreign grown cotton increased the acreage planted to, and the production of, foreign cotton would increase and vice versa. Changes in prices for cotton also would cause foreign cotton consumption to vary. As prices for cotton increased, foreign cotton consumption would decline and vice versa. Such movements in **cotton prices, production, and consumption abroad would affect ex-**port markets for U. S. cotton. Estimated adjustments in foreign cotton production and consumption that would be associated with changes in U. S. prices are explained in the Appendix for the fixed 75 and 90 Percent of Parity systems.

Because of the judgment factor in estimating some of the economic responses, because of the relatively restrictive assumptions that had to be made in some cases, because there is no assurance that the measured responses based on historical observations will hold in the future, and because general economic conditions in 1960 probably will differ somewhat from those assumed for the purpose of this report, the estimated economic effects should not be considered forecasts. They are simply illustrations designed only to indicate the relative effects in 1960 of the various systems of price support for cotton being discussed in this report.

The effects of the various support systems are estimated for the following specific economic factors relating to cotton: (1) Domestic mill consumption; (2) exports; (3) acreage; (4) farm value; (5) net farm income; (6) cost to the Government. For illustrative purposes a detailed description of the estimating procedure is given in the Appendix for the systems under which cotton is supported and marketed at 75 and 90 percent of the parity price. The methods and analysis used to estimate the economic effects of 75 and 90 percent of parity support programs were also employed for each of the other support systems.

A parity price of 35.5 cents per pound is used for each system in the determination of the appropriate price objectives, except for Cotton's Own Parity with and without a 50-Percent Efficiency Modifier. Some of the systems would cause prices received by farmers to be lower than under the present support system. In such cases the Modernized Parity price for cotton probably would not be as high in 1960 as that used to determine the price objectives in this report.

Estimated Economic Effects

Attention is directed in the discussion to a comparison of the several support price systems from the following standpoints:

1. Size of disappearance
2. Size of acreage reduction below uncontrolled acreage required by each system to balance production and disappearance
3. Cost to the Government of each system
4. Farm value of the crop (lint only)
5. Farm value of the crop less cost to the Government
6. Net farm income.

Size of Disappearance.- The largest disappearance, 14.7 million bales, is estimated in 1960 for the Cash Export Subsidy, Sale of CCC Stocks for Export, and the Certificate systems with price objectives of 65 and 80 percent of parity. The smallest disappearance, 11.4 million bales, is estimated for the 90 Percent of Parity system, with the 90 Percent of Cotton's Own Parity system a close second at 11.9 million. (See table 2.)

This ranking would not be expected to change in the more distant future. However, the spread between the two 90 percent systems and the others as a group from the standpoint of size of disappearance probably would widen substantially. This would primarily reflect the continued loss of export markets under the former systems in contrast to likely gains under the latter. In addition, gains in domestic consumption are likely to be larger for those systems which maintain lower prices for domestic use.

Table 2.- Estimated domestic mill consumption and exports of cotton under alternative systems of price support, 1960

System	Domestic mill consumption	Exports	Total disappearance
	Million bales	Million bales	Million bales
90 Percent of Parity	9.4	2.0	11.4
90 Percent of Cotton's Own Parity	9.5	2.4	11.9
75 Percent of Parity	10.2	4.2	14.4
Cotton's Own Parity with 50-Percent Efficiency Modifier	10.2	4.3	14.5
Certificate Plan			
65 and 90 percent of parity	9.4	4.8	14.2
65 and 80 percent of parity	9.9	4.8	14.7
Cash Export Subsidy			
65 and 90 percent of parity	9.4	4.8	14.2
65 and 80 percent of parity	9.9	4.8	14.7
Sale of CCC Stocks for Export			
65 and 90 percent of parity	9.4	4.8	14.2
65 and 80 percent of parity	9.9	4.8	14.7

Size of the Acreage Reduction Below Uncontrolled Acreage Required by Each System to Balance Production and Disappearance.- None of the systems described herein could operate successfully in 1960 without acreage controls. The size of the acreage reduction that would be required differs. The smallest reduction in acreage would be required under the Certificate Plan. With price objectives of 65 and 80 percent of parity, the reduction would be about 6.1 million acres. The largest reduction in acreage would be required by 90 Percent of Parity, 11.7 million acres. The 90 Percent of Cotton's Own Parity system would require the second largest reduction in acreage. The extent of the acreage reductions required under the various support price systems are shown in table 3. The yields assumed for these acreage calculations are discussed in the Appendix, page 55.

Table 3.- Estimated acreage allotments 1/ under alternative systems of price support and reduction in acreage 2/, 1960

System	Acreage allotment <u>1/</u>	Acreage reduction <u>2/</u>
	Million acres	Million acres
Certificate Plan		
65 and 90 percent of parity	16.5	7.1
65 and 80 percent of parity	17.1	6.1
Cotton's Own Parity with 50-Percent Efficiency modifier	16.9	6.4
75 Percent of Parity	16.8	6.6
Cash Export Subsidy		
65 and 90 percent of parity	16.5	8.5
65 and 80 percent of parity	17.1	6.8
Sale of CCC Stocks for Export		
65 and 90 percent of parity	16.5	8.5
65 and 80 percent of parity	17.1	6.8
90 Percent of Cotton's Own Parity	13.9	10.8
90 Percent of Parity	13.3	11.7

1/ Assumed to be equivalent to the acreage in cultivation on July 1 and to be sufficient to balance production and disappearance.

2/ Difference between the acreage that would have been planted in response to the price objectives and the acreage required to balance production and disappearance in 1960.

In 1960 the systems which would permit the largest acreage allotment are the Cash Export Subsidy, Sale of CCC Stocks for Export, and the Certificate Plan with price objectives of 65 and 80 percent of parity, each with about 17.1 million acres. The smallest acreage allotment would be permitted under 90 Percent of Parity, about 13.3 million acres.

With disappearance for many of the systems expected to be substantially larger in the more distant future, it is likely that the corresponding acreage allotments would be much closer to uncontrolled acreage than is estimated for 1960. However, the two 90 percent systems would still require large acreage reductions and would probably compare even less favorably with the other systems than in 1960.

Cost to the Government of Each System.- The cost to the Government of operating each system of price support in 1960 includes estimates of administrative and non-administrative costs.

The estimate of administrative costs associated with the various systems of price support will vary somewhat because of the difference in services performed under the different systems. A large part of the administrative cost is involved in acreage controls, which include acreage allotments, marketing quotas, and measurement of cotton acreage. CCC keeps its records of administrative expenses on an overall basis and not by commodities or programs. Therefore, it is difficult to arrive at accurate estimates for administrative expenses under the various systems, but it is believed that the relative cost of administration for 1960 would be about as shown in table 4. The following figures can, at best, be considered as estimates. Also, it should be pointed out that there are many possible variations in the provisions for the various systems. To be able to develop more accurate estimates, it is necessary to know the actual provisions of the program for which the estimates are being developed.

Table 4.- Estimated administrative cost of alternative systems of cotton price support, 1960

System	: Cost of : acreage : control	: Cost of : price : support	: Total
	: <u>Mil. dol.</u>	: <u>Mil. dol.</u>	: <u>Mil. dol.</u>
Certificate Plan	: 13.5	<u>1/</u> 11.5	25.0
Sale of CCC Stocks for Export	: 13.5	<u>1/</u> 7.5	21.0
90 Percent of Parity	: 13.2	5.0	18.2
90 Percent of Cotton's Own Parity	: 13.3	5.0	18.3
75 Percent of Parity	: 13.2	4.5	17.7
75 to 90 Percent of Parity	: 13.2	4.5	17.7
Cotton's Own Parity with 50- Percent Efficiency Modifier	: 13.6	4.0	17.6
Cash Export Subsidy	: 13.5	<u>1/</u> 4.0	17.5

1/ Includes administrative cost of Cotton Products Export Program.

The estimated total cost to the Government under each system in 1960, assuming effective acreage controls, is shown in table 5. The highest cost, 0.3 billion dollars, is estimated for the Cash Export Subsidy and Sale of CCC Stocks for Export systems with price objectives of 65 and 90 percent of parity. For the systems other than the two-price systems, costs to the Government would be relatively nominal.

Farm Value of the Crop (lint only).- Disregarding the cost to the Government for each system, the cotton crop in 1960 would have its highest value under the Cash Export Subsidy and Sale of CCC Stocks for Export systems with price objectives at 65 and 90 percent of parity, about 2.3 billion dollars. The lowest value would be under the 90 Percent of Parity system, about 1.8 billion dollars. Table 5 shows the estimated value for each system. In general, the farm value under the several two-price system would be higher than that under the other systems.

In the more distant future, the two 90 percent systems would probably be in a more disadvantageous position. This is because of the increased disparity expected in disappearance between the two 90 percent systems and the others.

The Farm Value of the Crop Less Cost to the Government.- The highest farm value less Government cost in 1960 occurred under the Export Subsidy system, Sale of CCC Stocks for Export system, and the Certificate Plan with 65 and 90 percent of parity price objectives, about 2.0 billion dollars. The lowest value less Government cost occurred under the 90 Percent of Parity system, about 1.8 billion dollars. The details for each system are shown in table 5.

Net Farm Income.- Estimates of net income to cotton producers under each of the several systems include only the income from 25 million acres of land, whether planted to cotton or to the best alternative crop. That is approximately the acreage which it is estimated would be planted to cotton under the 90 Percent of Parity system if there were no acreage controls. Net income includes income from cotton and cottonseed and the crops grown on acres diverted from cotton (the difference between 25 million acres and the acres of cotton estimated under each system) less operating expenses incurred in the production of these crops. Cost rates are based on the 1955 price level, but some increase in efficiency by 1960 is assumed.

The Cash Export Subsidy and the Sale of CCC Stocks for Export systems with 65 and 90 percent of parity price objectives provide the largest net incomes, 1.8 billion dollars. The lowest net income would result from supporting prices at Cotton's Own Parity with 50-Percent Efficiency Modifier, 1.4 billion dollars.

In the more distant future, the ranking of the various systems in this regard probably would remain about the same. However, the two 90 percent systems are likely to lose ground relative to the others because comparatively less land is likely to be devoted to the production of cotton.

Table 5.- Estimated farm value of the cotton crop and value less total cost to Government under alternative systems of price support, 1960

System	Farm value of cotton crop	Cost to the Government <u>1/</u>	Farm value of cotton crop less cost to Government
	<u>Billion dollars</u>	<u>Billion dollars</u>	<u>Billion dollars</u>
90 Percent of Parity	1.8	<u>2/</u>	1.8
90 Percent of Cotton's Own Parity	1.9	<u>2/</u>	1.9
Cotton's Own Parity with 50-Percent Efficiency Modifier	1.9	<u>2/</u>	1.9
75 Percent of Parity	1.9	<u>2/</u>	1.9
Cash Export Subsidy			
65 and 90 percent of parity	2.3	<u>3/</u> .3	2.0
65 and 80 percent of parity	2.1	<u>3/</u> .2	1.9
Sale of CCC Stocks for Export			
65 and 90 percent of parity	2.3	<u>3/</u> <u>4/</u> .3	2.0
65 and 80 percent of parity	2.1	<u>3/</u> <u>4/</u> .2	1.9
Certificate Plan			
65 and 90 percent of parity	2.1	<u>2/</u> <u>5/</u>	<u>6/</u> 2.0
65 and 80 percent of parity	2.0	<u>2/</u> <u>5/</u>	<u>6/</u> 1.9

1/ Includes administrative and non-administrative costs. As it is assumed in this report that acreage allotments are successful in balancing production and disappearance, this does not include any cost to the Government which would arise from production excesses.

2/ Less than 0.05 billion dollars.

3/ Includes export subsidy on cotton textile exports equivalent to 500,000 bales of cotton.

4/ Includes CCC acquisition cost of 6.5 dollars per bale on all exports.

5/ Includes export subsidy on cotton textile exports equivalent to 500,000 bales of cotton less sale of certificates for cotton textile imports equivalent to 250,000 bales of cotton.

6/ Computed before data were rounded.

APPENDIX

Illustration of Procedure for Estimating Economic Effects of Cotton Price Support Systems, Fixed 75 and 90 Percent of Parity

The purpose of the Appendix is twofold: (1) to give an indication of the procedure employed for estimating the effects in 1960 of the various cotton price support systems considered in this report and (2) to describe in detail the economic supply and demand relationships that form an integral part of the estimating procedure. These relationships are based both on judgment and on statistical measures of historical relationships. The estimating procedure also requires broad assumptions relating to future conditions. The results are not forecasts but merely estimates based on the components of the approach and are designed only to permit an indication of the comparative standing of specified criteria for the several systems in 1960. For the purpose of illustrating the procedure, the fixed 75 and 90 Percent of Parity Support systems are used. On the demand side, the factors that affect domestic mill consumption of cotton and domestic exports are discussed; on the supply side, the factors that determine the production of cotton in the United States are considered.

Domestic Mill Consumption. - Total consumption of cotton by domestic mills in 1960 was estimated by first estimating the pounds of cotton consumed per capita with farm prices at fixed 75 and 90 percent of parity and then multiplying the per capita consumption figures by the population estimate shown on page 41.

Per capita consumption of cotton increases as cotton prices decline, not only because of the direct effect of price on cotton consumption, but also because a consistently lower price for cotton will cause a smaller manmade fiber consumption per person than would exist with a consistently higher price level.

The demand relationships used to estimate cotton consumption are based upon historical relationships as determined by statistical analysis now under way. This research has not been completed and as it progresses some change from the relationships shown herein may result. The factors used to estimate the long-term changes in cotton consumption are shown below. The figures in parentheses indicate the percentage change in cotton consumption per person associated on the average with a 1-percent increase in each variable.

Long-term trend in manmade fiber consumption per capita in cotton equivalent pounds, (-0.14)

Current manmade fiber consumption per capita divided by long-term trend in consumption in cotton equivalent pounds, (-0.04)

Long-term real disposable income per capita, (0.74)

Current real disposable income per capita divided by long-term real disposable income per capita, (1.67)

Long-term cotton prices, deflated, (-0.40)

Current cotton prices, deflated, divided by long-term cotton prices, deflated, (-0.33)

The long-term variables take into account the experience of the recent past. Each observation is a weighted average of the data for the preceding 8 years with the weights declining progressively the further back in time they go. Other factors that may cause significant variations in mill consumption of cotton at any given time, such as changes in textile inventory investment, military demand, and textile export demand, are assumed to be negligible or offsetting.

The estimated consumption per capita of cotton and manmade fibers for 1960 is shown in table 6. The consumption of manmade fibers was estimated by taking into account the likely growth trends and the effects of variations in cotton prices on consumption of non-cellulosic fibers and on consumption of rayon and acetate. These estimates are based in part upon research results and in part upon the judgment of Department of Agriculture specialists. The estimates may differ from actual consumption in 1960 because, among other things, of the judgment factor, changes in economic relationships, and economic conditions in 1960 which differ from those assumed in this report. Nevertheless, the estimates probably indicate the kind of relationships that can be expected in the future between the two types of manmade fibers, rayon and acetate and the non-cellulosics, and between manmade fibers and cotton.

A pound of the various types of manmade fibers is equivalent, in end usage, to varying quantities of cotton. The cotton equivalent used herein for each pound of the various types of manmade fibers, on the average, is shown below.

Manmade Fibers	Cotton equivalent <u>pounds</u>
Regular and intermediate tenacity rayon and acetate	1.1
High tenacity rayon	1.3
Non-cellulosic fibers	2.1

Prices affect the total pounds of fibers consumed to a relatively slight extent. However, price changes have a considerable effect on the division of the total fiber market between various fibers. For example, table 6 shows that with prices for cotton at 75 percent of parity, cotton would have an estimated 69 percent and the manmade fibers approximately 31 percent of the total market in actual pounds. With a 90 percent of parity price for cotton, cotton's portion of the total market in actual pounds is estimated at 65 percent and manmade fibers at about 35 percent.

B. Cotton Exports. - Estimates of exports were made by deducting estimated foreign cotton production from estimated foreign cotton consumption.

Table 6.- Cotton and manmade fiber consumption per capita: Observed 1955 and estimated 1960 with cotton prices at fixed 75 percent and 90 percent of parity

Fiber	1955				1960							
					75 Percent of parity				90 Percent of parity			
	Actual		Cotton equivalent		Actual		Cotton equivalent		Actual		Cotton equivalent	
	Lb.	Pct.	Lb.	Pct.	Lb.	Pct.	Lb.	Pct.	Lb.	Pct.	Lb.	Pct.
Cotton	1/26.5	70	26.5	63	27.2	69	27.2	60	25.2	65	25.2	55
Manmade fibers	1/11.2	30	15.7	37	12.2	31	18.4	40	13.5	35	20.3	45
Rayon and acetate	8.6	23	10.3	24	8.0	20	9.6	21	9.0	23	10.8	24
Noncellulosic	2.6	7	5.4	13	4.2	11	8.8	19	4.5	12	9.5	21
Total	1/37.7	100	42.2	100	39.4	100	45.6	100	38.7	100	45.5	100

1/ Fiber consumption per capita in 1955 reflected to some extent the rebuilding of inventories of textiles. In 1954 and 1956 consumption per capita of cotton was about 1 pound less than in 1955. Consumption of manmade fibers per capita also was higher in 1955 than in 1954 and 1956.

This assumes that U. S. cotton continues to fill the residual share of the foreign market. The estimates of foreign consumption and production of cotton are, in large part, based upon the judgment of Department of Agriculture specialists.

It was assumed that the consumption of cotton per capita abroad would increase less than 0.05 of a pound per person per year from 1955 with cotton prices at 90 percent of parity. In the light of recent experience this assumption is very conservative. Cotton consumption could increase at a more rapid rate.

Manmade fiber consumption was assumed to increase about a tenth of a pound per person. With cotton prices at 75 percent of parity it was assumed that manmade fiber consumption would increase at a slightly lower rate than it would with cotton prices at 90 percent of parity. The decline in the rate of increase of manmade fiber consumption was then added to the rate of increase for cotton consumption. The assumptions concerning changes in relative consumption of cotton and manmade fibers are believed to be conservative. Actual changes in the rates of increase in cotton and manmade fiber consumption when the prices are varied more than 15 percent could be larger than those used in this report.

Foreign cotton production in 1960 was estimated by Department of Agriculture specialists who regularly analyze the cotton situation abroad. The estimates show about a 14 and 9 percent increase from 1955 under 90 and 75 percent of parity prices in the United States, respectively. (See tables 7 and 8.)

In addition, changes in stocks of cotton abroad have not been considered in export projections. Research has shown that before World War II declines in world prices of cotton caused stocks to increase and declines in consumption of cotton abroad caused foreign stocks to decrease. During the 1956-57 season some of the increase in our exports will undoubtedly be caused by an increase in cotton stocks abroad from the very low level of August 1, 1956.

The estimates of export responses shown in table 7 are rough approximations. A difference of a tenth of a pound per person in estimated consumption of cotton abroad in 1960, other factors being the same, would mean a difference of more than 500,000 bales in the estimate of U. S. exports. Relatively small variations in the estimates for one or more of the other variables shown in table 7 also would mean significant variation in U. S. exports.

Table 7.- Estimates pertaining to United States cotton exports in 1960

Item	Unit	90 Percent of parity	75 Percent of parity
Foreign cotton production	Million bales	28.3	27.1
Foreign cotton consumption	Million bales	30.3	31.3
United States exports	Million bales	2.0	4.2
Cotton equivalent of manmade fiber consumption abroad	1/ Million bales	14.4	13.1
Per capita cotton consumption: abroad	Pounds	5.6	5.8

1/ Estimated cotton equivalent pounds divided by 480.

Table 8.- United States cotton exports and related factors August year, 1955-56

Item	Unit	Quantity
Foreign starting cotton carryover	Million bales	11.4
Foreign cotton production	Million bales	24.8
United States cotton exports	Million bales	2.2
Total supply	Million bales	38.4
Foreign cotton consumption	Million bales	1/28.8
Foreign ending cotton carryover	Million bales:	9.6
Cotton equivalent of foreign manmade fiber production	Million bales	9.3

1/ Includes 0.2 million bales for exports to the U. S. and destroyed cotton.

C. United States Cotton Acreage and Production.- In estimating U. S. acreage it was assumed that at 90 percent of parity and with no acreage controls acreage planted to cotton would be about 25 million acres. At 75 percent of parity and no controls, it was assumed that acreage planted to cotton would be about 23.4 million acres. In other words, for each increase of one cent in cotton prices cotton acreage would increase about 294,000 acres in the following year and vice versa. This provides the basis for estimating the amount of acreage that would be planted to cotton in response to the price objectives assumed for each system of price support.

The trend in cotton yields during the last twenty-five years has been generally upward but it has been much sharper during the last few years. This increase resulted from (1) increased irrigation and other improved technology, including fertilizers, insecticides, etc., (2) shifts to high-yielding areas, and (3) land selection on individual farms because of smaller acreage allotments.

With cotton prices supported at a high level and with acreage controls all producing sections would maximize yield. The trends in the average United States yield probably would continue upward because of extended adoption of better technological practices.

With cotton prices supported at 75 percent of parity there would be somewhat less incentive to maximize yields and producers probably would tend to underplant their allotments more with supports at 75 percent of parity than they would if cotton were supported at higher levels. The reduction below maximum acreages would be much more pronounced in the marginal, low yielding areas. Yields might be lower on individual farms than under 90 percent supports but with higher percentages of acres in high-yielding areas, it is likely that the United States average yield per acre would be only moderately, if any, lower than under high supports.

Since 1951, under high supports and with acreage controls for three of the five years, the upward trend in yields has been phenomenal. The 1954-56 average of 389 pounds per acre compares with the 1950-52 average yield of 265 pounds per acre, or an increase of 124 pounds per acre. Most of this increase is thought to be the result of accelerated application of improved technology. Indications presently are for a continuation of the upward trend but future developments will determine the degree and limits.

If United States average yields increase 7 pounds per acre per year from the 1954-56 average to 1960, the average yield in 1960 would be about 425 pounds per acre. This yield projection is used for estimating the amount of acreage that would be required to balance production and disappearance at varying levels of price support in all situations considered in this report.

The demand and acreage estimates for 1950 with cotton prices at 75 and 90 percent of parity are shown in the following table:

Table 9.- Estimated disappearance and acreage in 1960 for United States cotton, under assumed conditions, and actual 1955

Item	Unit	Actual 1955 <u>1/</u>	1960	
			Market price at 75 percent of parity	Market price at 90 percent of parity
Support price, middling 7/8 inch	Cents per pound	32.4	26.6	32.0
Domestic mill consumption	<u>2/</u> Million bales	9.2	10.2	9.4
Exports	<u>2/</u> Million bales	2.2	4.2	2.0
Total disappearance	<u>2/</u> Million bales	11.4	14.4	11.4
Acreage	Million acres	<u>3/</u> 17.5	<u>4/</u> 16.8	<u>4/</u> 13.3

1/ Preliminary.

2/ Bales of 480 pounds net weight.

3/ Actual acreage in cultivation, July 1.

4/ Estimated acreage required to balance production and disappearance.